Including
The ST Resource
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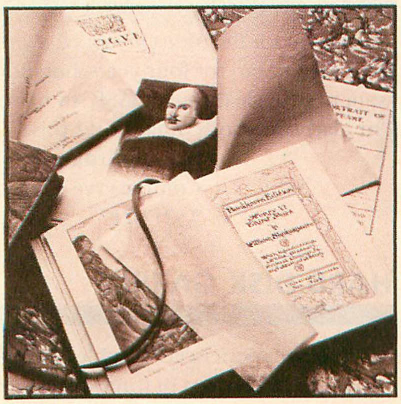
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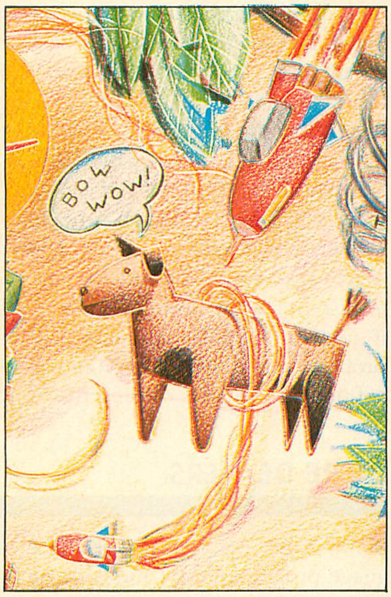
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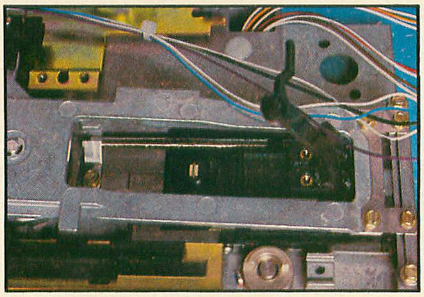
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CLEAN DRIVES

How can I clean the read/write head on my disk drive and how often?

Ed Forero
Compuserve I.D.
73247,330

*The **Antic** technical staff recommends cleaning the read/write head only if you start getting disk errors, and no more than once every six months. Gently use a Q-tip cotton swab and denatured alcohol. Note that on many drives, you need to open up the case in order to do this—which may void your warranty.* —ANTIC ED



ANTIC PROGRAMS ONLINE

Has anyone ever thought of offering **Antic** Magazine type-in programs for downloading on ANTIC ONLINE with a surcharge of 50 cents or $1? It would be like a selective disk subscription, allowing you to pay for only the programs that interest you.

Paul Henning
CompuServe I.D.
76414,305

Certainly an interesting idea. However, our current contract with CompuServe doesn't permit us to have programs for downloading on ANTIC ONLINE. —ANTIC ED

GROWN-UP

My mailman thought I had gotten a new magazine when the March **Antic** arrived. He said, "You're finally growing up," (I'm 42) as he handed me my issue. "No," I said, "The magazine is."

Les Green
Lilburn, GA

BACK TO BASIC

Thank you for the *New Owner's Column*. I've had an Atari for four years, but didn't want to struggle through BASIC by myself. I'm glad somebody finally did this.

Bob Dohrman
Compuserve I.D.
73217,217

HARD DISK GARBLE

Antic has experienced trouble with the early-release versions of three different ST hard disk drives—Atari, Haba and Supra. Apparently, a problem with the DMA (Direct Memory Access) process on some ST units causes the boot sector to become garbled when the DESKTOP.INF file is written to disk. Result: the desktop shows more than one billion unusable bytes paralyzing the hard disk. However, we have *no* difficulty using a hard disk if we load the DESKTOP.INF file into the ST from a 3.5-inch disk each time.

Antic has discussed the problem with Atari Corp. engineers and we are trying to discover what's going on. Meanwhile, if you buy a hard disk and have this problem—there's a chance your hard disk is fine and the ST is causing the trouble.

DE RE DEALERS

Before I got interested in assembly language programming, I foolishly ignored **Antic's** advice. Now that my interest in assembly language is increasing, every book and manual I buy refers back to (you guessed it) *De Re Atari*. Not only can't I find it, I hear it's no longer in print. Any help?

Steve Blasini
Compuserve I.D.
72327,1103

*It's usually available by mail for $9.95 from San Jose Computer, 1844 Almaden Road, Unit E, San Jose, CA 95125. (408) 723-2025. **Antic** is interested in hearing from readers who know other sources of this elusive manual.*—ANTIC ED

continued on page 10

BEST OF BOTH WORLDS

First, I'd like to thank all the **Antic** readers who took time to write (or upload) their comments responding to my editorial in the April, 1986 issue about coverage of the Atari 8-bit and ST computers. Your responses were thoughtful and strong, and we're still considering many of your suggestions.

The main question under consideration was which of these two approaches you would prefer:

1. **Antic** magazine covering only 8-bit Atari computers—and a separate, new, all-ST magazine.

2. A bigger **Antic** magazine covering both ST and 8-bit Ataris.

It turns out that this was not an easy choice for our readers to make. The survey votes were divided almost equally between the two alternatives—with separate ST and 8-bit magazines slightly in the lead.

Most of you who own *both* an 8-bit and an ST wanted **Antic** magazine to continue covering *all* Atari computers. The votes in favor of separate magazines came primarily from Atarians who own only an 8-bit, or only an ST—and who have no immediate plans to purchase another computer.

After considerable discussion and thought, here's the way I figure it. Antic Publishing must continue its tradition of support to the 8-bit Atari users, as well as the entire Atari community. However, the powerful new ST computers require longer and more complex pieces than **Antic** can accomodate. Clearly, ST owners need their own high-level magazine. A quarterly publication with ST disk seems like a realistic approach for us—we can do a good job, with top-notch talent, at a price any hobbyist can afford.

But take all ST material out of **Antic**? No, that's dumb. For one thing, almost half our respondents are interested in both types of computers and want **Antic** to continue covering the entire Atari product line. But we also want to serve those 8-bit owners who have no interest in the ST. So here's what we're going to do:

1. **Antic** magazine will devote a minimum of 60 to 70 percent of each issue's editorial space to material for 8-bit owners. The rest of the editorial pages will carry timely and useful ST material.

2. **START, The ST Quarterly,** a new title from Antic Publishing, appears June 1, 1986 and is totally dedicated to Atari ST computers.

The debut issue of **START**—packaged with an ST program disk—will be an indispensable tool for those who are serious about mastering advanced ST programming techniques. And while **START** is concentrating on advanced ST topics, **Antic** will continue the monthly ST Resource section at a significant level, but without overwhelming the quantity and quality of the 8-bit pages.

In this way we preserve **Antic** magazine's four-year tradition of

continued on next page

BEST OF BOTH WORLDS



Atari Resurgence Panel organized by SLCC at West Coast Computer Faire. From Left: David Small, Antic Contributing Editor; Bill Wilkinson of Optimized Systems Software; Leonard Tramiel, Atari Software Vice President; Sam Tramiel; President of Atari Corp.; Matthew Ratcliff, Winner of Antic Outstanding Writer Award; James Capparell, Publisher of Antic Magazine.

providing the best information and news for owners of *all* Atari computer models. This means **Antic** is committed to bringing owners of the Atari 400, 800, 1200XL, 600XL, 800XL, 65XE and 130XE the finest type-in programs, feature articles and reviews for the Atari 8-bit line. Authors and programmers for any model of Atari computer are warmly invited to submit their best work for possible publication. Those of you interested in both the ST and 8-bit Atari computers will welcome START's introductory subscription offer. One year of START (four issues with disks) costs $59.95—and includes 12 monthly issues of **Antic** (without disk) at this price. For those who want the Antic Disk subscription too, see the special offer on a subscription card in this issue. Yes, existing subscriptions can be extended and you won't get two copies of the same issues.

ATARI 8-BIT RESURGENCE

At the West Coast Computer Faire in April, I had the good fortune to be on a panel (ably organized by the San Leandro Computer Club) that included Atari Corp. president Sam Tramiel and Atari Software Development Vice President Leonard Tramiel. One of first questions from the standing-room-only audience was about Atari's commitment to the 8-bit product line.

The Tramiels stated flatly that Atari would have a major commitment to the 8-bit computer business for "a long time to come." Sam Tramiel specified several breakthrough 8-bit developments coming later this year. These developments include:

- A plug-in 80-column card including a parallel printer interface, due this summer at a price of $79.
- Memory chip expansions such as Apple is preparing for the IIe.
- 500K memory 3.5-inch disk drives for the 8-bit line, with a new Disk Operating System being written by Optimized Systems Software.
- New national mass-marketer distribution agreements—the first one signed with Toys R Us—that will also greatly improve the availability of third-party Atari software.

To this discussion, I was able to add that **Antic's** recent experience shows that the popularity of the new ST line is also bringing about a resurgence of interest in the 8-bit Ataris.

It looks as if 1986 may be the most exciting year for the Atari community yet. **Antic** thanks you—the reader—for helping create the Atari resurgence with your loyalty and enthusiasm.

Jim Capparell

James Capparell
Publisher

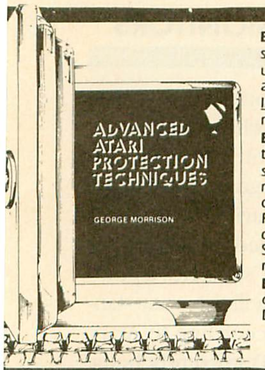


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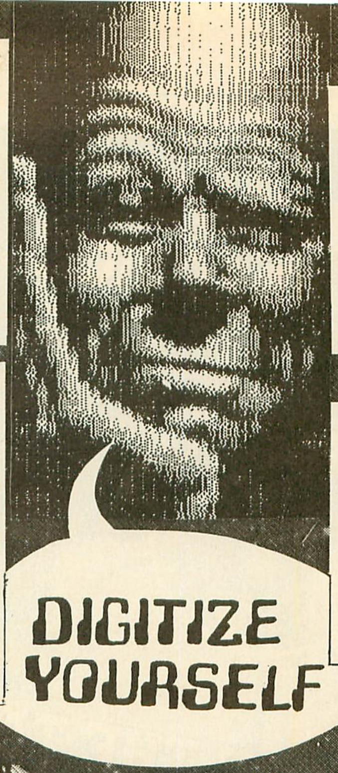


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continued from page 6

COMPOSITE ST MONITORS

Gary Grider of Frankfort, KY (CompuServe I.D. 71016,1000) tells us that in addition to the RGB color video and RF modulated television signals "officially" built into the earlier Atari 520STs, pin 2 on the video jack (labeled "reserved" or "not used" on some ST's) carries a composite video signal that will drive any standard color monitor. (According to Atari, the 520STs and 1040STs currently being shipped have composite plugs.) However, if you want to connect the composite pin on your ST, Grider says there are two wires to solder. Assuming you use shielded cable, solder the shielded center wire to pin 2, and solder the grounding sheath to pin 13. Here's how to find the right pins. As you look at the video plug in the back, there are three rows of four pins each, and a single pin underneath. These pins are numbered 1 to 13 going from top to bottom, right to left. Pin 2 is the top row, second from right. The grounding pin is the single pin at the bottom.

You don't want to chop up the video cable supplied with your ST to use the video plug? Atari ST 13-pin connectors are available from Alpha Products, 5740 Corsa Avenue, Westlake Village, CA 91362 (818) 889-9304. Alpha Products carries a wide range of plugs and jacks, including cable connectors for the Atari ST disk drive and MIDI.

BASIC MENU

Please tell me if you have, or will publish, an AUTORUN.SYS to list and automatically run selected BASIC programs from a menu.

Michael Boedeker
Eldridge, IA

*Yes, **Antic** has a AUTORUN.SYS file, a special program that tells your computer to perform a task as soon as you boot up the disk. It automatically RUNs another program, MENU, which will RUN any BASIC program. You'll find both of these listings on every copy of the **Antic** monthly disks.*—ANTIC ED

antic online

Worldwide Users Network

ANTIC ONLINE ART GALLERY

Plus June CES news

Type GO ANTIC when you log onto CompuServe in June. ANTIC ONLINE has something new starting this month—pictures. You'll find an art gallery of RLE VIDTEX high resolution visuals that you can download with a modem program and convert to your favorite Atari graphics format (8-bit or ST) with **Antic** type-in software. This issue's *VIDTEX Converter* story explains how.

You also won't want to miss the speedy, in-depth coverage of Atari news from the Consumer Electronics Show in Chicago. The June CES is the biggest American electronics trade fair of the year.

SIGNING UP

If you're not a CompuServe subscriber yet, see your local computer dealer or phone (800) 848-8199 for information about signing up. Ohio residents phone (614) 457-0802. There is no extra charge for accessing ANTIC ONLINE.

***Antic** welcomes your feedback, but we regret that the large volume of mail and online messages makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish (and upload) I/O answers to questions that are meaningful to a substantial number of readers and online subscribers.*

***Send letters to: Antic I/O Board, 524 Second Street, San Francisco, CA 94107.** ANTIC ONLINE has an I/O section for email to the Editors only—online queries about Antic products should be uploaded to the Customer Service I/O section of ANTIC ONLINE.*



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By Charles Mazel

DIGITIZING SHAKESPEARE

Restoring rare documents with 800XL and Computereyes



Tia Dodge

Blending ancient binding techniques with modern technology: The Folger Shakespeare Library restores the crumbling pages of rare literary manuscripts with the help of an Atari 800XL computer.

For Frank Mowery, the master bookbinder and chief conservator at the Folger Shakespeare Library in Washington D.C., book preservation combines both art and science. He must blend a deep understanding of the historic methods of papermaking and binding techniques with up-to-date knowledge of modern chemistry. Even so, many of the conservator's tools are the same traditional ones that have been in use for centuries. Now, an Atari 800XL computer, teamed up with an inexpensive video digitizer, is making the process faster and more accurate.

I was in Washington on business and dropped in on Frank, an old friend, at his laboratory in the library basement. He was working on making a new binding for a first edition of the complete works of Shakespeare, valued at somewhere around a quarter of a million dollars.

Many of the old books and documents that come into the possession of historic libraries are in poor condition to start out with. Over the centuries, paper will deteriorate if not stored under ideal conditions of temperature and humidity. Even when stored with care, bookworms may attack, leaving holes throughout an entire volume. Any handling of the fragile, crumbling paper could produce even more damage. Before the delicate documents can be made available to researchers or put on display, they must be restored.

continued on next page

CASTING LEAVES

Leaf casting, the specialized process of preserving centuries-old books and documents, is a complicated art practiced by only a few preservation laboratories in the United States. The leaf casting process involves "casting" new paper to replace deteriorated gaps and holes, or to add a new border to stabilize a fragile page. The leaf caster itself is basically a large tank fitted with a filter screen. The tank is filled with water to a level that covers the filter screen, and the "leaf" (or page of a book) is immersed in the water and placed on the filter. To create a frame to mold the new border, plastic sheets are used.

The conservator than adds a slurry of paper pulp made from recycled handmade paper. The slurry is mixed into the water over the paper, and a suction pump is turned on, drawing the water out of the tank from the bottom. The plastic sheets and the page are impermeable, however, so the water cannot pass through them. All the water is drawn through the holes in the page and through the border, carrying the suspended paper pulp with it. Trapped by the screen, the pulp is forced to accumulate where it is needed, and the fibrous pulp bonds to the edges of the old paper. After the water has been drawn out of the tank, the page is removed, placed between sheets of absorbent paper, and subjected to high pressure in a press, squeezing out most of the water. After the page is has dried slowly in the air, it is safe to handle or rebind.

The most critical phase of the process is adding the right amount of paper pulp slurry to the tank. If too little or too much is used, the "new" paper will be a different thickness than the "old" paper. The ideal thickness is typically four to eight thousandths of an inch.

In order to add the right amount of pulp, Frank must know the volume of paper he wishes to create. He can accurately measure the thickness of the page with a micrometer. But his problem was in measuring the area in square centimeters. With a few holes, a ragged edge and a reasonable sized border, he might need to produce well over one hundred square centimeters of new paper for a single page.

Frank's old method was to place a transparent centimeter grid over the page and count the number of squares that were over holes. This was inaccurate because of the uneven edges, which meant a lot of guesswork and approximation had to take pace. More importantly, though, it was an incredibly tedious process. To treat an entire book, it would have to be repeated, by hand, hundreds of times. This is where the Atari comes in.

ATARI COMES IN

Frank is always looking for better and faster ways to do things. Though he designed the leaf caster himself, he doesn't know much about electronics or computers. He had an IBM PC at the lab, but used it only for word processing.

While I sat back at a respectful, and safe, distance and watched Frank restore the works of Shakespeare, I started thinking of a way to speed up the process. First, I thought about paired arrays of light emitting diodes (LEDs) and photoreceptors placed above and below the page. The page would block off some of the LEDs, and it would only be necesssary to count how many receptors were turned on. But Frank was hoping to discover a way to treat pages up to about 60 by 90 centimeters. This would take quite a few components to achieve any accuracy—not to mention the wiring time.

I left Washington with Frank's request in the back of my mind. Sometime during the next few months I hit on the idea of using a video digitizer to capture an image of the page. I figured that if you put the page and a border on a light table and produced a high contrast image, you could probably adjust sensitivities so that the page would be black, and the space between it and the border would be white. It would then only be a matter of counting white pixels and comparing this to the number of white pixels produced by digitizing the border alone without a page to be treated. The digitizing process would not have to be very exacting, since I only needed a two-level output and was not concerned with shades of gray.

So, I started looking for video digitizers for the IBM PC. They would do more than I needed—1/30th of a second frame grabbing, 16 levels of gray—and they were expensive.

Then, at a computer show in Boston, I discovered a video digitizer aimed at hobbyists—Computereyes by Digital Vision, Inc. It was slow—taking six seconds to capture an image—but those Shakespeare manuscripts had been around for hundreds of years and weren't going anywhere fast. Best of all, the system was cheap, and would run on low-cost computers, including the Atari 800XL. For half of what the cheapest IBM PC digitizer would cost, the Folger Library could buy a Computereyes digitizer, video camera, Atari computer, disk drive and monitor—all the hardware necessary for a stand-alone system. I wrote a proposal to Folger which was accepted.

I was able to use the non-protected Computereyes software as the basis for a customized system. The main program is written in BASIC, with machine language routines for the actual image digitizing. This made it easy to modify the menu and add subroutines for performing the final calculation of needed slurry volume.

For the area-measuring application, it was necessary to perform one more step not normally done by Computereyes—counting the number of pixels in the digitized image. With the Atari's 320×192 high-resolution display, 61,440 pixels must be accounted for. A BASIC routine for counting the bits would have been painfully slow, so I wrote a machine language routine that takes about one second, and added it to the Computereyes routines.

The result is a stand-alone area-measuring system that was delivered to the Folger Shakespeare Library in October 1985.

I used the Computereyes system's ability to store and retrieve pictures to disk to add a nice touch to the program. When you first load the Folger leaf casting program, a high-resolution, 8-level image of William Shakespeare slowly fills up the blank screen. To the conservators—magic.

ARTMAKER

Gallery of grand graphics

by LEONARD BUCHANAN

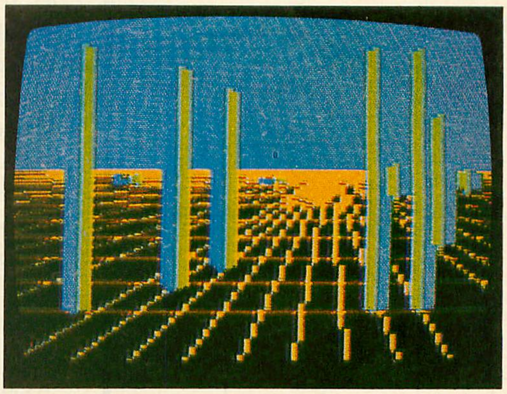
Enhance your computer artwork with intricately detailed patterns far beyond the capability of standard graphics software. ArtMaker is a menu-driven BASIC program that generates seven varied and intricate patterns in Graphics 10. You can SAVE them to disk for use with the most popular painting programs. It works on all 8-bit Atari computers with disk drive.

Submitted for your approval: the story of one Joseph T. Atari-Hacker. Through the sheer force of a sinister, subconscious, primordial urge, Joe is driven to purchase every graphics software package marketed for the Atari—sometimes several copies of each.

In the quiet of the evenings, alone in his room, Joe clutches a joystick in his fist, a touch tablet in his lap and lightpens behind his ears. One after another, he rips open software packages and stuffs the disks into his drive. "I am an artist! I am an artist!" Joe cries, struggling to draw just one decent microscreen.

His sweaty joystick creaks as Joe battles yet another Color Selection Menu. Down the block, Joe's neighbors close their windows to his nightly pain-wracked moans of anguish. They turn up their TV sets, protecting the ears of their children from Joe's pitiful pleas for help.

You see, Joe cannot draw!



Randomly generated buildings in Cityscape, one of seven Artmaker patterns.

If this tale from the computer graphics Twilight Zone hits too close to home, I apologize. The truth is that Joe's story is very common. The root of the problem lies not with the user, but with advertisments that claim graphics software can bring out the art in everyone's soul.

The trouble with these painting programs is that they need artists to do them justice. If you can't paint with a brush, you'll find it hard to paint with a touch tablet, and you'll *really* be lost with a joystick. The software keeps your circles round and your lines straight but it doesn't make a stick-figure look any more human, or six yellow circles look like a daisy.

One reason that amateur computer artists become disappointed with their home software is the lack of *detail* in home-made pictures. Coloring large sections with the "dot" patterns generated by an art program is not adding detail, only shading.

How about a background textured like Grandma's braided rug, or a Grecian fresco border around the picture, or a pyramid made of hundreds of multicolored lines and blocks? How about having a Navajo "Eye of God" pattern behind the text announcing

continued on next page

spelled T-I-M-E. And lots of it! A really detailed title page could take *days* to create.

This is a shame, considering that one of the best talents of the Atari is computing and plotting screen images quickly and accurately. Have you ever seen one of the moire patterns generated in Graphics 8, such as in the Screen Magic feature in Broderbund's Print Shop? There is abundant detail, all generated within the computer by a simple algorithm. Hundreds of lines, all perfectly spaced and angled to create an amazing visual pattern in less than a minute. What if you had to draw one of these with an art program? It could take weeks!

THE SOLUTION

ArtMaker is the answer my son and I have created to bring some professional-level detailing to home graphics software. It creates seven detailed screens you can save to disk to use with your Micro-Illustrator (KoalaPad, Atari Touch Tablet, etc.), Micro-Painter and compatible graphic programs (Computereyes, Graphic Master, etc.). Type in Listing 1, ARTMAKER.BAS, check it with TYPO II and SAVE it to disk before you RUN it.

For most of my art hacking I use Graphics 10, a nine-color, medium-high resolution mode. The ArtMaker patterns use Graphics 10, because this mode makes it easy to generate a wealth of picture detail very quickly and with very little effort on my part.

SEVEN CHOICES

1. The first ArtMaker pattern, Cityscape, draws a colorful urban landscape. It provides all the perspective lines and area fills which you can enhance after you move it to your paint program. Buildings in this program are randomly generated, so they will look different each time you choose the Cityscape option. You may want to redraw your city several times before finding one you want to save.

2. Eyeframe draws a border shaped like an eye.

3. Eye of God creates an elaborate Navajo ceremonial pattern.

4. Fresco places a Grecian fresco border along the top and bottom of the picture.

5. RNDcolor provides the only way I have found to get truly randomly-colored areas for your art programs.

6. Textures generates a myriad of intricate, free-flowing textures, patterns and designs. Change the value and/or placement of the variable Z, or the letters in A$, and you open the door to a breathtaking kaleidoscope of intertwined designs!

7. TVframe generates a border similar to Eye of God, but in the shape of a television screen.

When you find a picture you like, press [START] to save it to disk. Once saved, you may load it into your favorite art program.

HOW TO LOAD

ArtMaker saves your picture to disk under the filename D:PICTURE. This is because I use Micro Illustrator for most of my artwork, and it loads any 62-sector file named PICTURE when you press the [CLEAR] key.

You may want to change this filename to suit whatever art program you use, or use the type-in **Antic** *Rapid Graphics Converter* (November, 1985, page 33) to change your picture from its present format to any other graphics software format.

I hope that this article gets those graphics programs out of the disk boxes and back into the disk drives. Art programs should be enjoyable and, above all, they should use the power of your computer to help you express the beautiful images waiting inside your mind.

*Leonard Buchanan is a Computer Operations Manager in Maryland. He made his **Antic** debut in March, 1986 with the* Digital Dilithium Dahlias *simulation.*

(For details about the graphics software and hardware mentioned in this article, see the Graphics Products SourceList in this issue.)

Listing on page 92

Graphic Arts

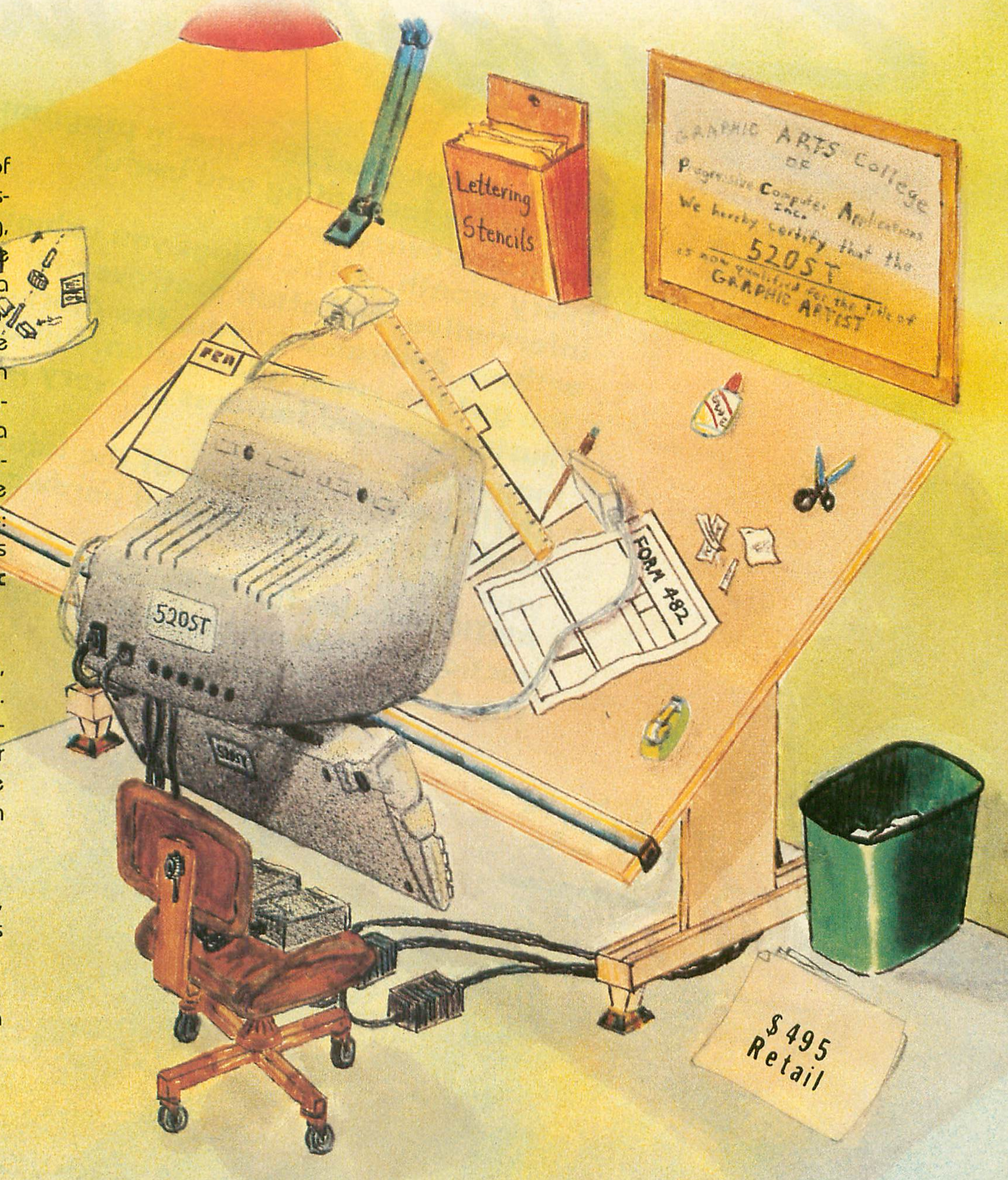
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- ☐ Fractions 5 . . . . MW038
- ☐ Special Skills 1 . . . . MW042
- ☐ Special Skills 2 . . . . MW022
- ☐ Circles & Graphs MW016
- ☐ Introduction to Algebra . . . MW010
- ☐ Algebra MW009
- ☐ Geometry MW036
- ☐ Advanced Algebra 1 . . . . . MW048
- ☐ Advanced Algebra 2 . . . . . MW007
- ☐ Business Math 1 . . . . MW034
- ☐ Business Math 2 . . . . MW032

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- ☐ Business Math Skills 1 . . . MW045
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- ☐ Diction MW047
- ☐ Phonics 1 . . . . MW028
- ☐ Phonics 2 . . . . MW039
- ☐ Phonics 3 . . . . MW024
- ☐ Phonics 4 . . . . MW025

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- ☐ Electronics 2 . . . . MW008
- ☐ Physics 1 . . . . MW006
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- ☐ Reading Development 4 . . MW017
- ☐ Reading Development 5 . . MW018
- ☐ Reading Development 6 . . MW020
- ☐ Reading Development 7 . . MW019
- ☐ Reading Development 8 . . MW049
- ☐ Classics 1 . . . . MW040
- ☐ Classics 2 . . . . MW026

Each listing (example: Fractions 1 MW023) contains four related programs.

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Ward Schumaker

Desert Chase is a fast-moving fly-and-shoot action game with some well-done perspective effects. The BASIC program works on all 8-bit Atari computers with 16K cassette or 24K disk.

DESERT CHASE

PROGRAM BY GUY AITCHINSON
ARTICLE BY CHARLES JACKSON

You play Fred, a Kansas wheat farmer who is paid for not growing wheat. While not plowing the fields one afternoon, Fred and his dog, Tito, are consumed by a violent tornado. It brings them to a musical, colorful land populated by magical elves who sing, dance, and use TYPO II.

These elves are being annoyed by an evil band of witches who live in a desert on the other side of the planet. Most every day, the bad witches shortsheet the elves' beds, hide their morning newspapers and fly around yelling, "Hey shorty, your mother's a fire hydrant!"

Your mission: You and Tito must fly the elves' patent-pending, brass-plated, sodium-powered, warp-driven, salad-spinning nuclear destructo-blaster space cruiser deep into enemy territory, and. . .

DESTROY ALL WITCHES!

But first, type in Listing 1, DESERT.BAS, check it with TYPO II and SAVE a copy before you RUN the program.

Until you came along, the elves only used their destructo-blaster cruiser for shopping trips and pleasant Sunday afternoon picnics in the surrounding countryside. Hence, it has a rather small fuel tank. When you run out of fuel, you crash and explode.

To compensate for this, the elves received a multi-trillion dollar government grant to develop the Sodium-Depleting Instrument (SDI). Upon contact with a witch's spaceship, SDI removes *all* sodium from the witch fuel tank and transfers it to yours. Without fuel, the witch's ship quickly loses power and blows up. What fun.

Your ship's radar (controlled by a type-in computer program from a popular Atari magazine) can detect a witch's ship before you can see it on the horizon. Use the radar wisely.

The SDI has a maximum range of 400 meters and a minimum range of 100 meters. Push the joystick forward to hit distant targets, pull back to hit the closer ones. Press the joystick button to fire the SDI. The indicator at the bottom of the screen tells you how far your SDI will travel before it hits

the ground. Each witch's ship carries 30 gallons of sodium.

Witches attack in waves of three screens each. Destroying all the witches on three consecutive screens allows you to advance to the next wave. If you fail to destroy a fleet of witches, they'll turn you into a toad and blow you up.

Your score, remaining fuel, and wave number are indicated at the top of the screen. There's no turning back. Strap Tito into the Navigator's seat, fire your engines, and begin your witch hunt.

Oh yes, and don't forget your ruby slippers!

*Guy Aitchison lives in Illinois, and has been programming his Atari for more than two years. **Antic** Program Editor Charles Jackson is known around the office for his hatred of computer games.*

Listing on page 95

GRAPHICS PRODUCT SOURCELIST

Where to find the graphics products discussed in this issue:

FOR 8-BIT ATARI

COMPUTEREYES

Video digitizer system captures images from your videocamera, VCR, or television set onto your 8-bit Atari computer. The $399.95 version includes a black-and-white video camera.

$129.95, 48K disk. Digital Vision, Inc., 14 Oak Street, Suite 2, Needham, MA 02192. (617) 444-0940.

MICRO ILLUSTRATOR

This is the graphics software that comes with most light pens and touch tablets made for the Atari such as the Atari Touch Tablet ($59.95, Atari Corp.) and KoalaPad ($99.95. Koala Technologies, 2065 Grand Junction Avenue, San Jose, CA 95131. (800) KOA-BEAR.)

MICRO-PAINTER

The original Atari joystick drawing program, this uses Graphics 7 1/2, a high resolution, four-color graphic mode and has set a standard format for Atari graphics files. The original manufacturer has gone out of business. PD Micropaint Artist ($10, Antic Catalog, PD053) is a public domain program that does the same job.

LISTER PLUS, PICTURE PLUS

Among other things, **Lister Plus** ($19.95) dumps any listed file (including programs) to the printer using any custom character set you choose. **Picture Plus** ($29.95) manipulates most types of picture files so you can save them to the printer in four sizes.

48K disk, requires BASIC. Non Standard Magic, P.O. Box 45, Girard, OH 44420. (216) 539-6033.

PRINT SHOP

This ultra-friendly program mixes text and graphics to create cards, stationery and banners that you print out on your graphics-capable dot-matrix printer. Additional libraries of graphics are available for $29.95 each.

$49.95, 48K disk. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 479-1170.

FOR ATARI ST

DEGAS

Easy-to-use, powerful paint program operates in all three ST graphic modes.

$39.95. Batteries Included, 30 Mural Street, Richmond Hill, Ontario L4B 1B5 Canada. (416) 881-9941.

DOODLE

The source code for this rudimentary graphics program offers examples of executable GEM calls for programmers. It is available only in the ST developer's kit which can be purchased from Atari Corp. for $300.

NEO

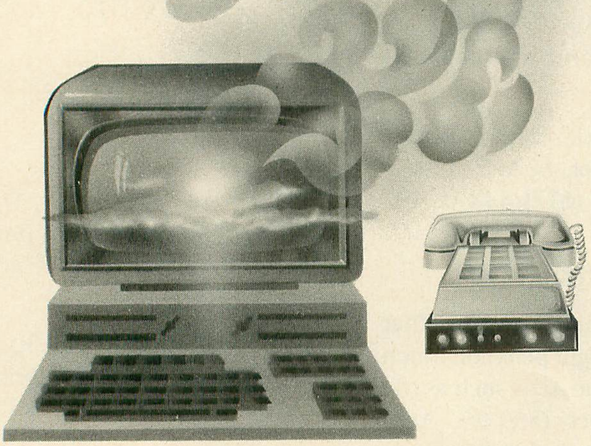
Atari Corp. originally gave away early versions of this paint program. However, it is not in the public domain and Atari plans to sell the final version this summer.

Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2000.

FLASH

This GEM-based, mouse-operated telecommunications program for the ST can access CompuServe VIDTEX high resolution graphics. (We also use Flash to maintain the ST section of Antic Online.)$39.95, Antic Catalog, ST0220.

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The Source	X	X	no	X	X	X	$49.95	$10.00	$8.40	$10.80

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- Organize a local, regional or national get-together in one of GEnie's 40 "conference rooms" with GEnie's ***Business Band Real-Time Conferencing.***
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AMAZING CARD SHUFFLER

Windows upon windows

by CHET WALTERS

Here's an eye-popping graphics display that proves the 8-bit Atari computer is no slowpoke when it comes to flashing multiple windows all over the screen. You can put your own pictures into the windows too. The BASIC program runs on 8-bit Atari computers with 48K and a disk drive.

While working with an Atari ST the other day, watching windows, upon windows, upon windows, I was struck with an idea for an interesting display program for Atari's reliable 8-bit machines. Thus was born **Antic's** Amazing Card Shuffler, which takes twelve quarter-screen windows and lays them one over the other in a hypnotic cascade of color, pattern and motion, much like a deck of cards being shuffled.

Antic's Amazing Card Shuffler is a very interesting display which you'll never grow tired of watching. If you design several quarter-screens especially for the shuffler, you can use it for advertising. It's quite an eye-catcher. Not only that, once you've keyed it all in, you've got four useful subroutines to include in your library!

The first thing you'll need is a formatted disk with DOS.SYS on it. Use either DOS 2 or DOS 2.5, or any other compatible DOS. Do **not** use DOS 3. (You can get DOS 2 on any Antic Monthly Disk, or from your local user's group.)

Next, delete DUP.SYS so you'll have lots of disk space to work with. If possible, use enhanced or double density because the "decks" created for shuffling take quite a bit of disk space—185 sectors.

THE PROGRAMS

It's very important to use the filenames noted here, or the Shuffler won't RUN properly. If you have this month's Antic Disk, copy the files COMPDECK.BAS, DECKLOAD.BAS, TITLE.PIC and SHUFFLE.BAS to another freshly formatted disk and you're ready to go.

If you're getting the programs from this month's Antic Disk, skip ahead to USING THE PROGRAM. Otherwise, experienced programmers as well as beginners should read these instructions *closely*. Be careful; these programs are *difficult* to type in. Type in Listing 1, COMPDECK.BAS, check it with TYPO II and SAVE a copy before you RUN it. However, if you have trouble typing in the special characters in lines 20, 100, 200, 20010-20050 and 22010, don't bother typing them in. Listing 2 and Listing 5 will create these lines for you.

When RUN, Listing 2 creates a disk file called LINES2.LST which contains lines 20, 100 and 200 for COMPDECK.BAS. Listing 5 creates a disk file called LINES1.LST which contains lines 20010-20050 and 22010 for COMPDECK.BAS. This file may also be used with Listing 3, DECKLOAD.BAS.

Type NEW and LOAD listing 1, COMPDECK.BAS. Now, ENTER LINES1.LST and LINES2.LST. Finally, SAVE the completed program to disk as COMPDECK.BAS.

You should also LIST lines 20000 to 23020 to another disk. To do this, type:

LIST "D:filename",20000,23020

This file contains a subroutine which lets you load microscreens into your BASIC programs. More on this later.

Now, type NEW and type-in Listing 3, DECKLOAD.BAS, check it with TYPO II and SAVE a copy to disk before you RUN it.

Once again, if you have trouble typing in the special characters in lines 150-160, 20010-20050 and 22010, don't bother typing them in. Listing 4 and Listing 5 will create these lines for you. When RUN, Listing 4 creates a disk file called LINES3.LST which contains lines 150-160.

If you used Listing 5 to help you type in COMPDECK.BAS, you can use the *same* file to help you with DECKLOAD.BAS. Type NEW and LOAD Listing 3, DECKLOAD.BAS. Next, ENTER

LINES1.LST and LINES3.LST. Finally, SAVE the completed program to disk as DECKLOAD.BAS.

Finally, type in Listing 6, SHUFFLE.BAS, check it with TYPO II and SAVE a copy to disk before you RUN it. Next, delete the three LINES files, and the three programs used to create them.

USING THE PROGRAM

At this point, you should have a disk with only four files on it: DOS.SYS, COMPDECK.BAS, DECKLOAD.BAS and SHUFFLE.BAS. If you're an Antic Disk subscriber, you will also be able to use two additional bonus programs, TITLE.PIC and a ready-to-run .DCK deck file.

Now you're ready to compile a deck of "cards" with COMPDECK.BAS and your microscreen collection.

When you RUN it, COMPDECK.BAS asks you for a name for your deck. Type in any filename you wish, as long as it does *not* have an extender (such as .PIC) or a device identifier (such as D:). CARDS, for example, is an acceptable name, but D:CARDS, CARDS.SHF or D:CARDS.SHF are not acceptable names. When the COMPDECK.BAS program compiles your deck, it automatically adds a .DCK extender for use with the shuffler program. All .DCK files are written to disk drive 1.

When the program asks you to verify the deck name, make sure the name displayed has the form "D:filename.DCK". Otherwise, type [N] and re-enter it.

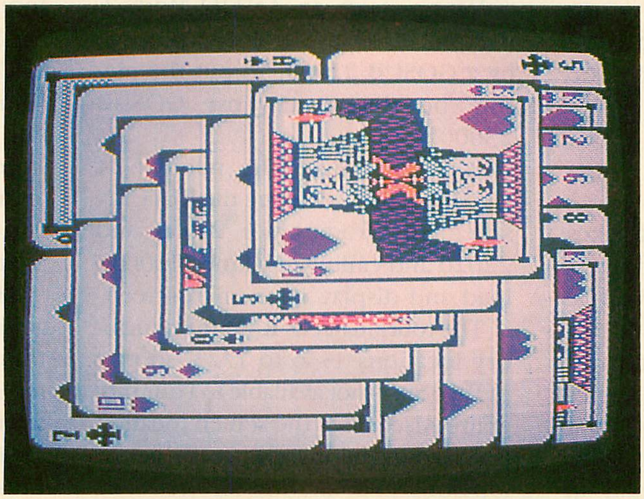
Next, enter the number of the drive from which you will be loading your microscreens. If you have two drives, you should choose drive 2 for your picture disks. It makes this a lot easier!

You can use microscreens created by either Micro-Painter or Micro Illustrator (KoalaPad, Atari Touch Tablet, etc.). If they're in a different format, you can use **Antic's** Rapid Graphics Converter (November, 1985) to convert your pictures into a compatible format.

When the COMPDECK program loads your picture, you'll notice that the colors have been reversed over most of the screen. You'll also see a window which frames about a quarter of the screen. Within this window, the colors are displayed normally.

Using the arrow keys or your joystick, move the window to frame the "card" you wish to lift from the screen. You can move the window faster by holding down the [CONTROL] key while using the arrow keys, or simply hold the joystick in the direction you want to move. In a moment, the window will speed up.

Press [RETURN], or push the joystick trigger, to save the card in the deck. Press [ESC] to go back to the LOAD menu.



Repeat the LOAD and SAVE steps until you have saved a series of 12 cards (windows), thus completing your "deck."

The program will display instructions to guide you through each step. There are a few cautions to consider, however. Since the Shuffler program displays your deck on a single screen, all of your cards must be "color compatible." This means each screen you load must have been drawn using similar colors. All pictures loaded into the compiler will be displayed using the colors of the first card. These color registers are always the first five bytes written to your deck file.

Should you have some files that are problematic as far as color compatibility goes, you can use Picture Plus ($29.95, Non-Standard Magic) or RAMbrandt ($19.95, Antic Catalog, AP157) to swap the colors where necessary.

One important note: the COMPDECK.BAS program adds information to your deck file throughout compilation. If you press the [SYSTEM RESET] key, you will *crash* the disk. If you wish to stop the program before you've entered all 12 cards, take your .DCK disk (the one with your .DCK file) and put it in drive 1. Then type /EXIT and the program will end. You won't be able to use this partial .DCK file, but your disk will be safe.

It's wise to compile your deck files on a scratch disk, then copy them to the "good" program disk. If you're using only one drive, please make sure it has the appropriate disk in it (as instructed by the prompts for each step). If everything has gone correctly, you're ready to. . .

SHUFFLE A DECK

Shuffling your deck is quite simple. Place your program disk (the one with DECKLOAD.BAS and SHUFFLE.BAS) into drive 1. DECKLOAD.BAS and SHUFFLE.BAS *must* be on the same disk. If you have a one-drive system, you should also put your .DCK files on this disk. Otherwise, your deck files may occupy a separate disk and be accessed through drive 2.

You may also include a picture file on your program disk. Loading a deck takes some time, so you might want to use this file as a title screen to look at while you wait. Your title screen may be in either Micro-Painter or Micro Illustrator (Koala) format, and should be named TITLE.PIC.

RUNNING THE PROGRAM

Simply type RUN "D:DECKLOAD.BAS". The deck loader is the controller program, which automatically RUNs the shuffler program.

Since a deck of cards takes up so much RAM, we must find some way

continued on next page

to conserve memory for our program. The deckloader first displays any available title screen, then, as its name suggests, loads a deck of cards into RAM. Finally, it tells the computer to RUN the shuffler program. Now for the beauty part—the computer clears the deck loader from memory, then loads the shuffler program in its place.

The names of all files with the extender .DCK (denoting "deck" files) present on the disk will be displayed. Select a file by typing in the name as it appears on the screen. If a title screen is present, the program will display it while loading your deck. This takes about 30 seconds.

Once the shuffle is underway, press the [OPTION] key to set the slowest speed. Press the [SELECT] key each time you want to step up the speed of the shuffle. Press [START] to return to the deck loader for another deck. Press any key to pause or resume the shuffle sequence.

SOME NOTES

- If the DOS you are using takes up more RAM than DOS 2.5, only 11 of the 12 cards in your deck will be shuffled.
- You can change the pattern of the shuffle by altering the DATA lines of the shuffler program, but I don't recommend it. If you're experimenting with the shuffler program in memory, you can just type RUN after you've made any changes.
- If you wish to draw some custom designed screens for the shuffler, Listing 7, QUARTER.BAS, will create a blank microscreen template that's divided into quarters. Save the template to disk in a file named PICTURE. To help you design cards that are just the right size for the shuffler, this PICTURE screen can then be loaded into Micro-Painter by entering the filename PICTURE, or into Micro Illustrator by pressing the [CLEAR] key.

USEFUL SUBROUTINES

As mentioned earlier, the microscreen loader subroutine (which you hopefully have LISTED to your favorite utilities disk) appears in Lines 20000 to 23020 of COMPDECK.BAS (Listing 1) and DECKLOAD.BAS (Listing 3).

Used in any BASIC program, it can load either a Micro-Painter or Micro Illustrator picture file (figuring out which kind of file it is without any help from you). Not only that, it loads compressed Micro Illustrator files in about half the time you're used to. The screen is transferred, still in its compressed form, directly from the disk into a buffer. Then the buffer is treated as a RAMdisk to get the picture onto the screen.

To use the subroutine in your own program, first initialize the necessary variables by a GOSUB 20000, which should be done by your first program line. To load a picture from a disk into the buffer, fill the variable FI$ with a filename in the form "Dn:filename.*" and GOSUB 21000.

Next, set up an ANTIC Mode E (Graphics 7+) display list for pictures by a GOSUB 22000. To put the picture on the screen, use GOSUB 23000.

You can reduce the number of GOSUB calls by deleting the RETURN statements from Lines 21060 and 22020 and calling just Line 21000 to load and display your microscreen.

The routine needs RAM from memory locations 1536 to 1723, so part of Page Six is not available to your program. Also, since the screen location is stored in the variable SCR, the file type in TYPE, and the screen colors in array C( ), you shouldn't use these variables in your main program. All variables in the subroutine will change value with each call, so use them with caution in your main code.

The subroutine also changes the BASIC data pointer to point to Line 21000. Keep this in mind if your program is reading information from your own DATA statements.

Another routine located at line 22010 creates a Graphics 7+ screen for displaying pictures. If you want a text window at the bottom, change the GRAPHICS 24 to GRAPHICS 8.

A machine language routine defined in Line 20010 as CIO$ is a very straightforward call to your Atari's SIO routines. This routine quickly transfers areas of RAM to or from a disk file. It is illustrated in Line 21040 of COMPDECK.BAS (Listing 1), and more clearly in line 60 of QUARTER.BAS (Listing 7).

As illustrated in the programs, you must first OPEN your disk file for access (explained in detail below) and pass four parameters in the USR call to the machine language subroutine. The subroutine is stored as control characters in CIO$. The first parameter is the IOCB channel number, multiplied by 16. If you use channel #1, the first parameter would be 16. For channel #2, you'd use 32 and so on.

The second parameter is the *command* parameter. It varies with the task you wish to perform. To load a disk file **into** the computer, you must first OPEN your file for reading. The number 4 in the command:

OPEN #n,4,0,"D:filename" tells the computer that you wish to open a file and read it. When you open a file to read it, you must *also* set the command parameter to 7. To *write* a section of memory to disk, use an 8 instead of a 4 in your OPEN statement (example: OPEN #n,8,0,"D:filename") and use an "11" for your command parameter.

The third parameter is the starting address of the area of RAM to be transferred. The fourth and final parameter is the number of bytes you wish to transfer.

Finally (and most importantly) you must *always* CLOSE the channel to your disk file when you're through with it! It's easy to CLOSE a channel. To CLOSE channel #2, for example, the command would be:CLOSE #2

Another useful machine language routine is stored in MV$ in Line 20020 of Listing 1. It rapidly moves bytes from one area of RAM to another. In line 20020, for example, it's used to move a machine language routine from BF$ into Page Six. This is a very fast and memory-efficient way to initialize RAM with non-relocatable machine language routines. As you can see, it's *much* faster than READing the bytes from DATA statements and POKEing them into memory. It's also used in Line 23020 to move uncompressed picture file data from the string buffer BF$ to the screen.

This routine has three parameters

which a BASIC program must supply. The first parameter, shown in line 23020 as ADR(BF$), is the starting address of the source RAM. In other words, this is the address of the first byte to be moved.

The second parameter is the starting address of the destination RAM. This is where we want our data to wind up. The routine picks up data from the Source address, and moves it to the Destination address.

The third and final parameter is, of course, the number of bytes to be moved.

*Chet Walters wrote the respected print utility software **Lister Plus** ($19.95) and **Picture Plus** ($29.95). Available from Non-Standard Magic, P.O. Box 45, Girard, OH 44420. (216) 539-6033. Requires 48K disk.*

(For details about the graphics software and hardware mentioned in this article, see the Graphics Products Source List in this issue.)

Listing on page 88

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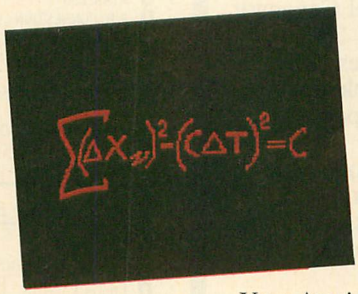
ANTIC OPTICAL ILLUSION CHALLENGE

Can you emulate the Lightstick?



They're called Lightsticks and they're on display at places like Disneyland's Videopolis and San Francisco's Exploratorium. The Lightstick produces one of the cleverest optical illusions around. The creator of the Lightstick says its illusion cannot be duplicated on a personal computer. So here's an **Antic** challenge: Can you create the Lightstick Illusion on your 8-bit or ST Atari computer?

At first glance, the Lightstick looks like nothing more than a six-foot-high column of blinking red LEDs (light emitting diodes) flashing against a black background. The LEDs are flashing *thousands* of times every second, so fast that the column appears to be merely a vertical red light that's flickering a bit.



Look directly at the Lightstick and you'll see nothing special. But look past it, or turn your head away, and images appear to spring from that column of LEDs. There are pictures, banners, slogans—all in red—and they appear to hang momentarily in the air.

The images look something like bright red high-resolution graphics pictures, and they're formed in the same way as a picture on your Atari video display. Each of the Lightstick's hundreds of LEDs is individually controlled, flashing on and off in accordance with patterns stored in the Lightstick's memory. Each fraction of a second, the LEDs flash a very narrow vertical slice of the picture—like one vertical column on a computer's screen. It's impossible to tell what a picture is if you just see one column at a time.

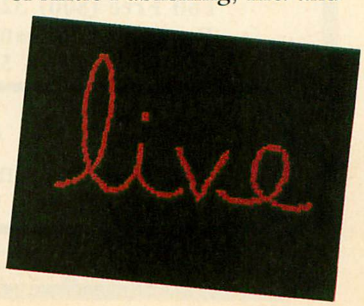
Bill Bell, the Boston designer who created the Lightstick, says the effect depends on several things. One is very bright LEDs flashing very fast (some Lightsticks have more than one LED for each horizontal row of the column, to make the image brighter). Another essential is a dark background. A third is rapid eye movement and peripheral vision; you can't see the images by looking directly at the Lightstick.

THE CHALLENGE

We'd like to see you try to emulate the Lightstick on your Atari—and we think **Antic** readers would like to see the results of your efforts. We'd also like to see what *other* kinds of optical illusions you can create using your Atari.

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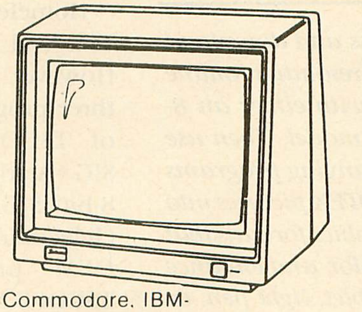
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Personal Pascal 520ST . $49
Personal Prologue 520ST Call
Writer's Tool w/ Spell Checker (R) $44
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Ultima 3 520ST $39
Ultima 4 (D) $39
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Kampfgruppe (D) $37
NAM (D) $25
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Six-Gun Shootout (D) ... $25
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Flight Simulator 2 (D) ... $32
Flight Simulator 520ST . Call
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Mindwheel 520ST $29
Syn-Calc (D) $33
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TELLARIUM
Amazon 520ST $33
Fahrenheit 451 520ST .. $33
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Megafont (D) $19
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VIDTEX CONVERTER

Online to Koala and back

by CHARLES JACKSON, **Antic** Program Editor

*Learn how to access and download CompuServe's high-resolution online VIDTEX graphics with either an 8-bit Atari or an ST model. Then use one of the accompanying programs to convert your VIDTEX pictures into standard Atari graphics formats that you can change, color, and enhance with your touch tablet, light-pen, or joystick. The 8-bit BASIC programs require an Atari computer with at least 48K memory and disk drive. (See this issue's **ST Resource** for the GrafCon-ST VIDTEX converter program.)*

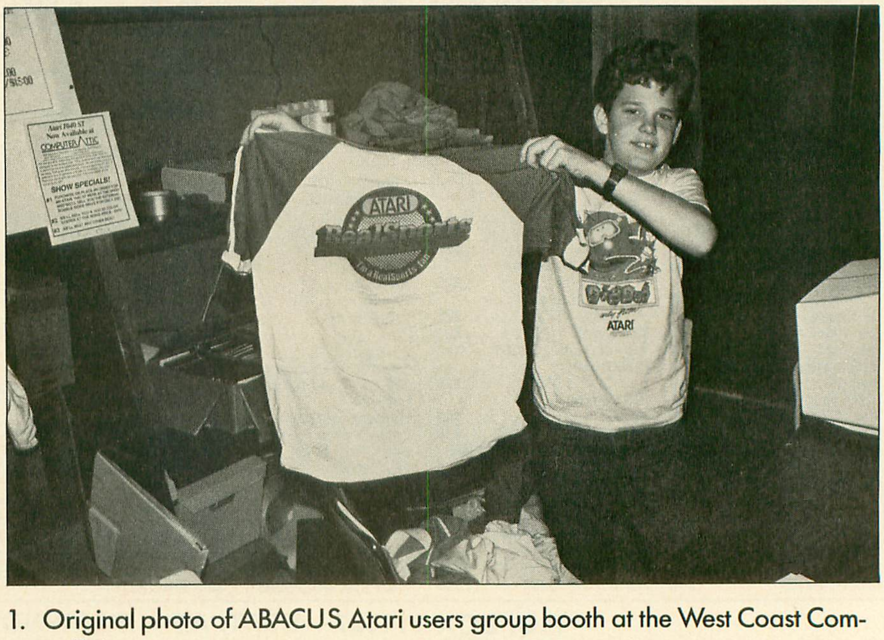
VIDTEX is CompuServe's trade name for its collection of telecommunications programs developed by an in-house programming staff. One VIDTEX program, titled Video Special Effects, lets CompuServe draw high-resolution pictures and diagrams on your video screen.

VIDTEX graphics support is now available for most of the widely used personal computers—including all Atari 8-bit and ST models. You can view CompuServe's VIDTEX pictures with a modem program that supports VIDTEX graphics. Owners of 8-bit Ataris can use TSCOPE, a public domain program. ST owners can use Flash (available in the Antic Catalog).

HomeTerm, Pro*Term and BackTalk will *not* work with VIDTEX. However, you can use any of these three programs to download a copy of TSCOPE from CompuServe's SIG*Atari. To do this, enter the Atari 8-bit SIG, go to Data Library 2 (Telecommunications). Use XMODEM protocol to download TSCOPE.XMO—or MSCOPE.XMO if you own an MPP modem. Rename the file AUTORUN.SYS and you're ready to go.

The Antic Catalog also has several public domain versions of TSCOPE available on disk. PD024 is for 850 interface users, PD025 is for the 1030 modem and PD040 has MSCOPE, a variant for MPP modems.

Log onto CompuServe with a modem program that supports VIDTEX graphics (TSCOPE or Flash) and set your software for VIDTEX. Here, TSCOPE users should press any one



1. Original photo of ABACUS Atari users group booth at the West Coast Computer Faire.

of the console keys while typing a [9]. If you're using Flash, tap the [INSERT] key and type **mo vi** on the command line.

Next, you need to tell the CompuServe computers that you want to use VIDTEX. At the ! command prompt, type GO DEFALT to get to the Terminal/Options Menu, and choose Option 2 (Setting Your Terminal Type). A menu will appear, listing several different terminal types. Choose VIDTEX (Option 1). In a moment, CompuServe will report that your terminal has been set for use with VIDTEX graphics.

When you exit the Terminal/Options Menu, you'll be asked whether you want to make these changes effective for all future sessions (Option 1), or just for the current online session (Option 2). If you choose Option 1, VIDTEX will be your default terminal type whenever you log-on.

GETTING THE PICTURE

CompuServe uses VIDTEX graphics to display computer art, digitized photographs, aviation weather maps, and even pictures of the felons on the FBI's 10 Most Wanted list. Below are some of the places on CompuServe where you'll find VIDTEX graphics. To get there, type in one of the commands at right when you see a [!] prompt.

Computer Art Gallery	GO VID-100
Weather Maps	GO AWX-4
FBI 10 Most Wanted	GO TEN-114
Digitized Photos	GO CB-58
Digitized Photos	GO CBIG
Digitized Photos	GO HHA-88
Digitized Photos	GO PCS-155
Digitized Photos	GO ARTSIG

INTRODUCING RLE

All high resolution VIDTEX pictures are black-and-white images measuring 256 pixels across by 192 scan lines tall. These images are stored and transmitted in RLE (Run-Length Encoding) format. While most Atari graphics files (such as those created by Micro-Painter, DEGAS, Graphic Shop, KoalaPad and Atari Touch Tablet) are bit-image "maps" of the image, an RLE file consists of instructions for retracing the picture on your screen.

WELCOME TO THE NIGHT SHIFT

You can also find RLE graphics on several bulletin boards (BBS). **The Night Shift**, based in Staten Island, New York, has one of the first BBS libraries of high resolution VIDTEX graphics.

The Night Shift, which runs on a TRS-80 computer, offers download libraries for many types of computers, including the 8-bit Atari and the ST.

The BBS is organized like a building—you enter on the "Main Floor," electronic mail is handled in the "Mailroom," graphics and photographs are kept in the "Darkroom" and so on. Newcomers might also want to visit the "Cafeteria," the "Employee's Lounge," and the "Computer Department."

Sysop Peter Paul founded the BBS about four years ago while working the late-night shift at a Manhattan insurance agency. "He named the board after his funny hours," said Michael Schuster, sysop (system operator) of the Night Shift's Atari section.

Schuster and Paul added an RLE library in March. The library contains Computereyes pictures, logos from several local boards and freehand drawings. Many of these files were created with **Antic's** machine-language RLE Converter. The RLE library is in the "Basement" of the BBS, next to the "Darkroom."

The Night Shift operates 24 hours a day, full duplex, at 300, 1200 and 2400 baud. Dial (718) 816-7792. There is a one-time $5 registration fee.—CJ

If we could listen to an RLE file "talking" to your computer screen, the monologue would sound something like this: "Go into a high-resolution, black-and-white graphics mode and clear the screen. Starting with the farthest left pixel on the top scan line, plot 19 black pixels followed by 27 white pixels. Now plot 2 black pixels followed by 39 white pixels. Now plot 57 black pixels followed by one white pixel. . ."

In an RLE file, these plotting instructions are stored as pairs of bytes, but the bytes take the form of ASCII characters. The first byte of each character pair represents the number of background (black) pixels to plot, and the second represents the number of foreground (white) pixels to plot.

Once a scan line is filled, plotting will wrap around to the next scan line. For example, if we've just plotted the first 200 pixels of a 256-pixel scan line, and we receive an RLE instruction telling us to plot 50 black pixels followed by 50 white pixels, the plotting instructions would proceed like this: "Plot 50 black pixels followed by six white pixels. This completes our 256-pixel scan line. Now plot the remaining 44 white pixels at the far left of the next scan line."

There are a few more rules. Each ASCII character in the pair represents the actual pixel count plus 32. For example, the character pair CJ represents 35 black pixels (35 + 32 = 67—an ASCII "C"), followed by 42 white pixels (42 + 32 = 74—an ASCII "J").

If a pixel count exceeds 127, the excess should be carried over to the next pair of characters. For example, if we have a row of 100 black pixels followed by one white pixel, the RLE instructions would say: "Plot 95 black pixels followed by zero white pixels. Now plot 5 black pixels followed by one white pixel."

Conveniently, these rules ensure that all RLE files are ASCII text files, and can be treated as such for send-

continued on next page



DISK BONUS

Antic Disk subscribers this month receive a special bonus file, RLE.EXE. It changes Micro-Painter or Koala picture files into RLE files in *less than ten seconds*. It also converts high resolution RLE files into Micro-Painter picture files. This all-machine-language version of RLEMAKE.BAS is too long to print as a type-in listing.

First, you should copy RLE.EXE to a formatted disk, and rename the file AUTORUN.SYS. This will be your RLE Program Disk. Remove any cartridges from your computer, place the disk in the drive, and turn on your computer. If you're using an XL or an XE computer, you should press the [OPTION] key while turning on the computer.

ing and receiving them. (In other words, the parity bit may be ignored.)

PROGRAM LISTINGS

The three program listings included in this issue will help you create and collect your own RLE Graphic files. Listing 1, RLEMAKE.BAS, a program for the 8-bit Atari, will convert any picture file in Micro-Painter format into an RLE Graphic file. It will also convert pictures created with Computereyes. (The program is *not* compatible with the GTIA version of Computereyes).

Listing 2, BUILD.BAS, is another program for the 8-bit Atari. This program converts any RLE file into a Micro-Painter-compatible file. If you don't own Micro-Painter software, you can use the *Rapid Graphics Converter* (**Antic**, November 1985) to switch your picture formats.

Listing 3, GRAFCON.C, is a full-featured graphics conversion program for the 520ST. One of its options lets you convert ST picture files (DEGAS, NEO or DOODLE) into RLE files. See the *GrafCon-ST* article in this issue's **ST Resource** for full details.

INSTRUCTIONS: LISTING 1

Type in Listing 1, RLEMAKE.BAS, check it with TYPO II and SAVE a copy. When you RUN it, RLEMAKE.BAS will ask you for the name of a Micro-Painter picture to convert. Insert your picture disk into the drive, type in the name of the picture you wish to convert, and press [RETURN]. The program will also ask you to choose a name for the resulting RLE file. Type in an appropriate name (such files usually have a .RLE extender, like MYPIC.RLE) and press [RETURN].

The program will load your picture, display it on an ANTIC Mode F (Graphics 8) screen, and ask if you wish to invert the colors.

Next, the program will ask you if you're satisfied with the way the picture appears on the screen. If not, answer [N] to the "Are You Sure" prompt and you'll be returned to the "Invert It?" prompt. When you type [Y], insert your destination disk and press the [START] key to begin the conversion. During the conversion, you'll see a small cursor creep across the screen, marking the program's progress through the picture.

ARTIFACTING

Since we're working in a black and white mode, some of your four-color microscreens may look a little different when loaded into the converter. Color television sets and some monitors will seem to display two additional colors—usually blue and orange.

These two extra colors are a product of "artifacting." Artifacting occurs when a monitor's resolution is not fine enough to distinguish two adjacent pixels of different colors. In their place, the monitor will display an orange or blue dot.

Although an RLE picture using artifact colors may look fine on a television set, the artifact colors will look like closely packed vertical stripes when viewed on a high resolution monitor. The Commodore 1702 monitor and the Atari ST monitors (both color and monochrome) are three such monitors which do not support artifacting. Since your RLE picture files can be seen on any VIDTEX-

compatible computer system (not just Atari), it might be a good idea to keep artifact colors to a minimum.

INSTRUCTIONS: LISTING 2

Most RLE files are "read-only," not designed for downloading, so it used to be difficult to get a clean copy of an RLE screen. But now you can use *any* modem program that offers a "capture" function. BUILD.BAS will change any high resolution RLE file into a picture file compatible with Micro-Painter.

Type in Listing 2, BUILD.BAS, check it with TYPO II and SAVE a copy before you RUN it. It's time to capture an RLE file to your disk. The procedure is simple:

1. Open your modem program's Capture Buffer.
2. Display the RLE picture. (Note: If your modem program doesn't support VIDTEX graphics, the picture will appear as "meaningless characters." This is acceptable; you should capture these "meaningless characters" in lieu of the picture.)
3. Press [RETURN], close the Capture Buffer and save it to a disk file.

After you have an RLE file on a disk, RUN Listing 2 and type in the name of the RLE file you wish to convert. Type in a name for your resulting picture file. Finally, insert your RLE disk and press [RETURN].

The program will search for the beginning of the RLE picture file (denoted by an [ESC] [G] [H] sequence) then reconstruct the file on your screen. When it reaches the end of the RLE file (denoted by an [ESC] [G] [N] sequence,) it will write the picture to disk as a Micro-Painter picture file.

OPERATIONS

The program will ask what type of picture to convert. Type [K] to convert a Koala picture, type [M] for a picture in Micro-Painter format, or type [R] to change an RLE file into a Micro-Painter file.

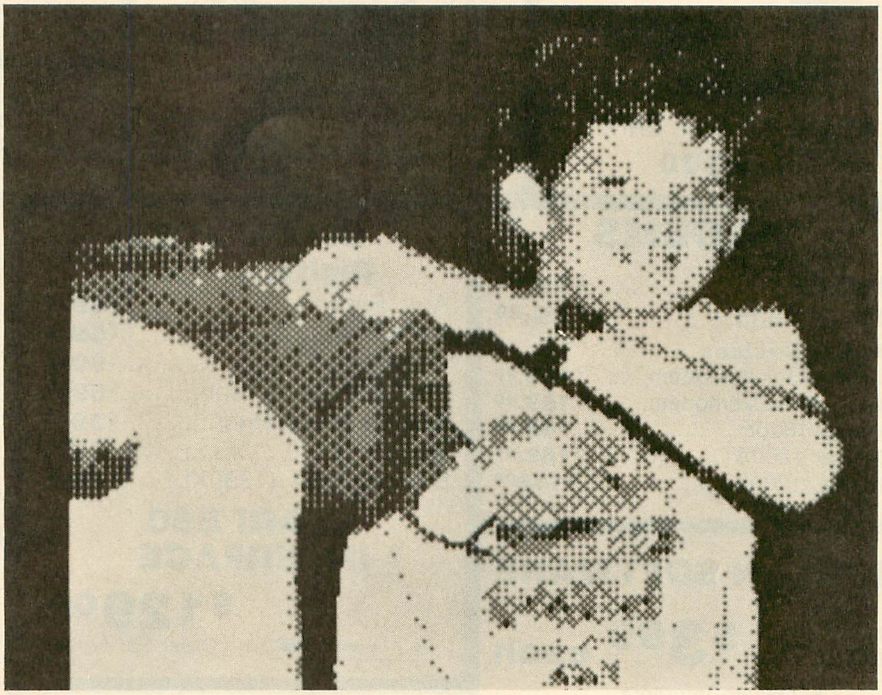
Use the [K]oala option to load Atari Touch Tablet, Chalkboard and all other implementations of Micro Illustrator software. Use the [M]icro-Painter option to load Computereyes pictures and any other 62-sector, high resolution picture files.

NOTE: The best RLE files tend come from microscreens having plenty of contrast. Computereyes pictures created with 4-Level, 8-Level and Normal Capture modes also yield good results.

The program will ask you for the name of the picture to be converted.

Next, type in a name for the RLE file to be created, press [RETURN], and the program will load your source picture. Once your picture is loaded, the program will ask if you want to invert the colors, and then ask if you're sure you like the way the picture looks. If you change your mind and decide to load a different picture, press the [ESCAPE] key to return to the main menu. Otherwise, insert your destination disk and press [RETURN] to start the conversion.

Unlike its BASIC counterpart, this RLE converter needs only a few *seconds* to process a picture. A thin, horizontal line racing down the screen lets you watch the converter's progress through the picture (but don't blink, or you'll miss it!).



2. As seen on ANTIC ONLINE after formatting with VIDTEX Converter.

A device identifier such as "D1:" is optional. If you leave it off, the program will read your picture from drive number one.

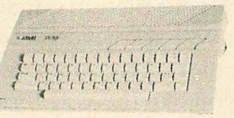
Type in the name of your picture. (Note: some versions of Micro Illustrator automatically append a ".PIC" extender to all picture files.) If you wish to see a disk directory, type DIR instead of the picture name, and the computer will display the names of all files present in disk drive number one.

(For details about the graphics software and hardware mentioned in this article, see the Graphics Products SourceList in this issue.)

Listing on page 94

ATARI SPECTACULAR

ATARI 65XE



2 Free Programs!

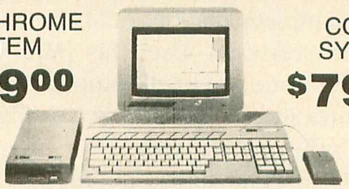
$89.99

CALL FOR PACKAGE!

520ST SYSTEM PACKAGE

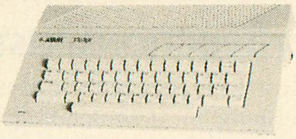
MONOCHROME SYSTEM **$649.00**

COLOR SYSTEM **$799.00**



COMPLETE SYSTEM PACKAGE INCLUDES:
520ST computer with modulator, disk drive, mouse, logo, Basic, 1st Word, and monochrome or color monitor.

ATARI 130XE

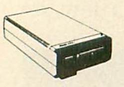


2 Free Programs!

$139.00

CALL FOR PACKAGE!

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DISK DRIVE
DOS 3.0

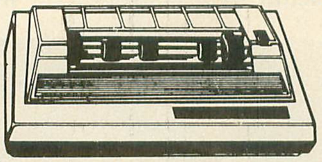


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MODEMS

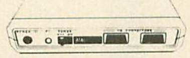
ATARI 1030..............$59.99
ATARI 835................$29.99

Digital Devices
U-Call Pocket Modem..........$99.99
Anchor Volksmodem..........$59.99
Supra 1000E......................$49.99
Supra 1200AT.................$159.00
Supra 1200ST..................$159.00

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- Diamond Mind

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Maxell 5¼" SS/SD (10)................$11.99
Elephant 5¼" SS/SD (10).............$11.99
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NEW OWNERS COLUMN

Lesson 5: Number Crunching

by DAVID PLOTKIN, **Antic** Contributing Editor

Learn the essentials of Atari number crunching. To become an effective programmer, you need to know how to make your computer perform standard calculations. This BASIC tutorial includes a type-in listing that will run on all 8-bit Atari computers of any memory size, with disk or cassette. David Plotkin's course in beginner's BASIC programming started in the February, 1986 issue of ***Antic****.*

Your Atari home computer can do word processing, play games (of course), and keep track of data for you. But computers weren't invented to do any of these tasks. They were invented to *compute* the results of numeric formulas (hence the name "computer"). This month, I'll show you how to use your Atari to "crunch" numbers, a vital element in many kinds of programming.

Atari BASIC's set of mathematical functions is detailed below. I am assuming that you understand mathematical functions such as *sine* and *log*. If you don't, refer to a math textbook.

ARITHMETIC OPERATORS

Arithmetic operators are the symbols used to add, multiply, subtract, divide, and exponentiate (raise to a power):

+	addition
–	subtraction
*	multiplication
/	division
^	exponentiation

In general, these symbols should look familiar to you, as they are the same symbols used to write a formula down on paper. Two are a little different, however. The multiplication symbol is an asterisk [*] since the multiplication symbol you use on paper looks just like an "x". The exponentiation symbol is also different, due to the limits of computer displays. Normally, when you raise a number to a power, you would write it like this: X^y.

This means x raised to the y power. In Atari BASIC, you would write it as **X^Y**. Here are a few examples of simple math formulas:

```
10 X=2*6
20 Y=3^3:REM (3 to the third power=9)
30 Z=X+Y/3
```

Let's look at a variation of line 30 for a moment:

```
30 Z=3+6/3
```

It is not obvious whether the answer is 5 or 3. If you first divide 6 by 3 and then add 3, the answer is 5. If you add 3 to 6 (making 9) and then divide by 3, then the answer is 3. The problem here is determining the order the calculations should be performed in. There are two ways to resolve it.

The first way is to use parentheses, as you would in regular math. BASIC will first evaluate what is inside a pair of parentheses, then evaluate what is outside the parentheses:

```
10 Z=(3+6)/9:REM clearly evaluates to 1
```

If you don't use parentheses, then BASIC will evaluate an equation in the following order:

1. The results of all function calls such as Sine, Cosine and Log will be evaluated. These will be discussed in a little while.
2. Exponentiation. That is, all numbers will be raised to the assigned power.
3. All multiplications and divisions. If there is more than one multiplication and/or division, they will be evaluated, in order, from left to right.
4. All additions and subtractions. If there is more than one addition and/or subtraction, they will be evaluated from left to right.

Thus, the following two equations will give the same answer. (Note that the second version is easier to figure out!):

2+6/3*2^2 and 2+((6/3)*(2^2))

In addition to the arithmetic operators used above, Atari BASIC offers several groups of powerful functions already built-in and ready for use. I have broadly broken these up into three categories:

Trigonometric functions, **Transcendental** functions, and **Other** functions. (So, I ran out of names!)

TRIGONOMETRIC FUNCTIONS

The trigonometric functions supported by BASIC are as follows:

SIN sine of an angle
COS cosine of an angle
ATN arctangent of an angle

Here's how these functions might look in a BASIC program:

```
10 A=SIN(X)
20 B=COS(X)
30 C=ATN(X)
```

The results of each of these functions can either be in **degrees** or **radians**. To select which way you want to input your data and get your results, use the commands **DEG** for degrees and **RAD** for radians.

10 Z=SIN(180*2):REM SIN(360) (This happens to be zero.)

TRANSCENDENTAL FUNCTIONS

There are only three transcendental functions, and the first two are the opposite of each other. The first is **LOG**, which takes the natural logarithm of the statement in parentheses:

10 Z=LOG(2*3+4):REM LOG(10)

Note that this is *not* the logarithm in base 10, but in the "natural" base, a number otherwise known as *"e"*, which is approximately equal to 2.71828. If you don't know what this means, chances are you won't ever need it anyway. The transcendental functions show up most often in compound interest calculations where interest is compounded continuously.

EXP is the second function in this category. It raises *"e"* to the power shown in the parentheses:

10 Z=EXP(1):REM this is 2.71828 . . .

Note that EXP(LOG(X))=X because EXP and LOG are opposite operations.

The last function in this category is **CLOG**, which takes the common (base 10) logarithm of the statement in parentheses:

100 Z=CLOG(100):REM, which is 2.

OTHER FUNCTIONS

Each of the remaining functions listed below operates on the argument in the parentheses:

1. **ABS** returns the absolute value of the argument. If the argument is positive or zero, it is equal to its absolute value. If the argument is negative, ABS returns the positive equivalent: ABS(5)=5 and ABS(-5)=5.

2. **SQR** returns the square root of the argument. That is, the number which when multiplied by itself, gives the argument: SQR(9)=3 because 3*3=9.

3. **INT** returns the integer portion of a real number. I'll explain. Normally, when you use your Atari to calculate a number, the answer is a number containing a decimal point and a certain number of decimal places. For example, 5/2=2.5, and 1/3=0.333333 . . . The INT function removes the decimal point and all numbers to the right of the decimal point, leaving only the whole number. So, INT(5/2)=2, and INT(1/3)=0. Note that INT always returns the next *lower* whole number, so INT(-1/3)=-1, since -1 is the next lower whole number of the answer, -0.3333 . . . The INT function is especially useful when doing screen graphics, since every point on the screen is a whole number, not a fraction.

4. **RND(0)** is the random number generator. It generates a random number between 0 and 1. While you may sometimes want a random number between 0 and 1, more often you will want a random number that falls into a range which you specify. For example, let's say you want a random number that falls between A and B:

10 Z=A+(B-A)*RND(0):REM uses this formula.

If A=10 and B=20, then this formula will provide random numbers between 10 and 20, never equaling either 10 or 20. RND(0) returns a number between 0 and 1, multiplying it by A-B or 10 gives a number between 0 and 10, then adds 10 to (A) to finish things up.

Getting a random INTeger which falls between integers A and B (inclusive) is just a bit trickier:

10 Z=A+INT((B-A+1)*RND(0))

If A=10 and B=20, this equation will evaluate as follows: RND(0) will return a number greater than 0 and less than 1. Multiplying this number by 11 (B-A+1) returns a number greater than 0 and less than 11. Taking the integer of this number returns an integer between 0 and 10. Finally, adding this number to 10 (A) returns an integer between 10 and 20. Choosing a random integer within a specified range is *very* useful in generating explosions using the SOUND statement, flashing screen colors, and plotting random points on the screen. These commands will be covered in future columns.

continued on page 49

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product reviews

RAMBO XL

ICD, Inc.
1220 Rock Street
Rockford, IL 61101
(815) 968-2228
$49.95
(installation, $30)
(256K RAM chip set, $28)

Reviewed by Matthew Ratcliff

The **RAMBO XL** is a hardware modification for the Atari 800XL or 1200XL computer that turns your machine into a 256K RAM system—twice as powerful as the 130XE.

RAMBO XL makes your 800XL or 1200XL compatible with the 130XE in "CPU mode" for extended memory. Thus the Atari DOS 2.5 RAMdisk and BASIC XE will run on your computer after this installation.

This extra memory will be primarily used as a RAMdisk, "fooling" your computer into using this extra memory as a second disk drive. However, the Atari DOS 2.5 RAMdisk only recognizes 64K of the available 192K. The 256K chip set replaces the 64K chips. It is not added to the originals, therefore the lower 64K of the 256K takes the place of the original chips. The remaining 192K is available as extended bank switch memory.

To make full use of the extended memory you will need a DOS that supports it. A utility on ICD's **SpartaDOS Construction Set** ($39.95) supports the 192K and gives you a true double-density RAMdisk.

Any software that supports the extra memory of the 130XE should use 64K of the extra RAM that RAMBO XL provides. According to the documentation, the following programs have been tested to work with this modification: BASIC XE, OSS; SynFile+, Broderbund; Atari DOS 2.5 RAMdisk; PaperClip, Batteries Included.

One feature not supported is the ANTIC mode, where display memory resides in one bank, accessed by the ANTIC chip while the working memory (program, data, etc.) is accessed separately in another bank by the CPU chip. This feature is unique to the Atari 130XE and its FREDDY chip. However, it is seldom used and will not be missed.

After installing my RAMBO XL, I tested it thoroughly by making club disks for our ACE St. Louis user group. Using the SpartaDOS sector copy utility, with the RAMdisk option, I was able to copy from a master disk to RAM, and then from RAM to multiple destination floppies in no time. I created 15 disks that were perfect mirror copies of their originals.

When used with the Covox Voice Master, which provides full 130XE support, the software automatically set up with a 130XE version. The modification has performed flawlessly since I added it to my old 800XL. Installation is another matter, however.

INSTALLATION

RAMBO XL requires relatively minimal soldering if your computer chips are "socketed"—plugged into chip holders instead of soldered directly to the circuit board.

If the chips are soldered directly to the board—as many 800XLs are—then you should not attempt this modification unless you are an experienced "solder jockey" with access to a good desoldering station.

I think all 1200XL computers were socketed. So after the computer is disassembled, it is a simple matter of prying out the old chips with a small flat blade screw driver. But you can't be sure about an 800XL until you disassemble it.

The eight RAM chips on my 800XL were not socketed on my 800XL, so I had to desolder them and add sockets to the machine myself. (Being an electrical engineer, I had access to a desoldering station.) The installation involves unplugging the old RAM chips, a decoder chip and the PIA chip. Five pins on the PIA must be "bent out" and the chip is returned to its socket. You have to plug in new RAMs and a small circuit board in place of the decoder. You make one to three jumper modifications and solder 5 wires to the PIA chip.

The documentation is a complete guide. Note carefully the recommended 20-35 watt ratings for your soldering iron with a fine point for electronic applications. Don't use one of those heavy duty soldering guns, unless you want to cook some RAM chips or vaporize some etch.

You may wish to purchase your RAM chips from another mail order house instead of from ICD. Complete sets of 256K RAMs can be had for $20 or less, when purchased in quantity. ICD does not package them with the kit because "RAM prices change faster than computer prices. Nobody wants to be caught holding a large inventory when the price drops." ICD simply keeps some RAMs in stock for those who prefer the convience of taking care of the entire upgrade in one order. So shop around, or get some friends together to make a group buy from an electronics mail order service.

If you hate to get rid of the old faithful XL in favor of the XE, this kit may be just the ticket. If you are an incessant hardware tinkerer, you will have great fun with this project. If you are a SpartaDOS user, you will find RAMBO XL an invaluable addition. With a full 192K RAMdisk instead of the 64K on the 130XE, I use the 800XL in preference to the 130XE all the time.

I probably find more need for a RAMDISK than most because I develop a lot of software with MAC/65, and .INCLUDE files from RAMdisk make for blazingly fast assemblies of huge source files. I will be using the RAMBO 800XL regularly until I can get my hands on a 512K modification for the 130XE.

product reviews

ULTIMA IV

(Origin Systems)
Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
$49.95, 48K disk

Reviewed by Harvey Bernstein

According to Webster's Dictionary, an Avatar is the embodiment of a quality or concept. In order to complete **Ultima IV: Quest of the Avatar**, you must become the living embodiment of *eight* qualities. And believe me, folks, it ain't easy.

Ultima IV is not only the finest game in the award-winning series by Lord British, it is also my current all-time favorite graphic fantasy role-playing adventure. Usually, when a sequel to a popular game is published, it amounts to little more than a rehash of the original. But by successfully adding spiritual/moral/philosophical elements to the action, Ultima IV is raised above the mundane to a class of its own.

At the start of Ultima IV, you are asked a series of questions with morally ambiguous answers. Your character is set up via this process, making your real-life personality a significant factor in successfully completing the game. Depending upon your responses to the questions, you start off at a given level in one of eight professions—bard, tinker, mage, etc.

As the game progresses, it is your task to gain perfection in the values of Honesty, Compassion, Valor, Sprituality, Humility, Sacrifice, Justice and Honor. Only then can you go on to the final challenge and become a true Avatar.

The most novel thing about Ultima IV is the way you can carry on complete conversations with other characters. The towns of Brittania have literally hundreds of different inhabitants. Some may join your quest and most of them can provide much-needed hints along the way—if you ask the right questions. In fact, you will *definitely* need to take detailed notes, because a character in one town will often refer you to somebody in a different town. I would say that it is impossible to finish the game without detailed and accurate records.

All this is not to imply that the hack-and-slash element of previous Ultimas has been dropped. Don't forget, there are still hostile forces in the land. Combat is handled much the same as in the other Lord British games, except that now you must sometimes fight mixed groups of enemies. The number of opponents you must face at one time depends on the number of people in your party, making the game easier in the beginning.

The graphics, as in previous Ultimas, do not exactly tax the Atari's capabilities. However, the depth of play is so great, the goals so challenging, that this one limitation of Ultima IV is acceptable. It is also nice to see more game companies following the lead of Infocom and providing high-quality support materials. Ultima IV comes with two manuals (one general and one on magic), a metal ankh, and a cloth map. For the first time, the map shows the location of all the towns, making it a lot easier to find your way around.

If you enjoyed previous Ultimas, by all means buy Ultima IV. If you've never played the others and wonder what the fuss is about, this is the perfect place to start.

SCREENS

Soft Cellar
P.O. Box 311
Rochester, NY 14616
$19.95, 32K disk

Reviewed by Scot Tumlin

Screens, a flexible 100% machine language utility program, enables you to create and control as many as nine independent windows with positioned text and simple graphics displays. In these windows, you can mix character sets and display text in several different sizes.

The software installs a "W:" device handler in the form of a 4K AUTORUN.SYS file which can be inserted into your own program. Then Screens lets you use BASIC CIO (Central Input Output) commands to control the windows on the screen. Any programming language that supports the CIO will work with this software.

For experienced BASIC programmers, creating fancy windows with Screens is just a matter of working with the same CIO commands used to access any of the other standard Atari device handlers.

Screens also has additional NOTE/POINT commands to store and retrieve windows in memory—helpful when windows overlap each other. Two additional XIO commands let the user add borders to a window and invert the characters inside it. The program allows modification of 15 window parameters.

To program a window with Screens: Pick a graphics mode and open an IOCB channel as device "W:" for both input and output. Use the XIO 100 command to modify the window size, write the new values with the POINT command and place a border around the window with the XIO 101 command. PRINT some window text in your choice of sizes. Poll the keyboard for characters to print in the window. If the [RETURN] or [BREAK] key is pressed, close the window and END the program.

The manual is easy to understand and every concept is explained with a BASIC example, a nice touch. There's also a selection of sample programs included on the disk.

continued on next page

product reviews

ACE80

TNT Computing
P.O. Box 443
Holt, MI 48842
(517) 394-2412
$49.95, 16K cartridge

Reviewed by Andy Eddy

The **ACE80** is an 80-column cartridge for 8-bit Atari computers. The ACE80XL version is for the single slot of XL/XE models, or the left slot of the 800. The ACE80 is for the right slot of the 800, allowing you to use a language cartridge in the left slot for 80-column programming.

The ACE80 includes a disk of "patch" programs for modifying software to work with the 80 columns. The patches currently include Letter Perfect (version 6), BASIC and OS/A+, with a Speedscript addition promised soon.

The first time I loaded my Letter Perfect word processor with the ACE80, I thought I was sitting at the wrong computer. To see a document formatted onscreen as it will look on the page is cause for relief. Most importantly, file compatibility and editing power are retained.

With all this in its favor, I still found the text to be somewhat poor in resolution. At worst, characters like O have a filled-in appearance and letters with multiple vertical components like M, N and H can be hard to tell apart. Letters that are similar in capitals and lower-case such as C and P can also give you trouble. But I found that if you use ACE80 for a while, you adapt to the shortcomings of the display.

The software-generated ACE80 works by intercepting calls to the operating system, running them through the reprogrammed screen editor and replacing the normal character set with a high resolution Graphics 8 set. It's important to note that most software manufacturers won't support the ACE80, so all concerns must be referred to TNT.

Many of us Atari loyalists have compiled software libraries of sizable proportions. It makes much more sense to mold our computers to our needs, rather than purchase an incompatible computer just for 80-column power. The ACE80 seems to fit this need suitably and at a price that won't break the bank.

COMPUTE!'s THIRD BOOK OF ATARI

COMPUTE! Books
P.O. Box 5058
Greensboro, NC 27403
(800) 334-0868

Reviewed by Matthew Ratcliff

COMPUTE!'s Third Book of ATARI is an anthology of useful information, a compendium of their best Atari works since, well... *COMPUTE!'s Second Book of ATARI.* If you are a regular reader of COMPUTE! magazine, you won't see much new here, but a few of the articles have been updated and some go into more depth than a magazine publication can usually allow.

Even if you kept all the back issues, it is quite handy to have the best of COMPUTE!'s Atari work in one volume. Since the magazine has begun covering every computer from Atari to Zenith, it is rather difficult to locate back-issue articles of particular interest. Old standards are covered including a character set editor, sound effects, a few games and even a word processor.

The word processor presented is "SCRIPTOR," a rather simple BASIC program. COMPUTE!'s newer 100% machine language word processor for the Atari, "SPEEDSCRIPT 3.0" offers a lot more—except maybe for a beginner who might consider it a learning experience.

One very helpful article is "Reading the Keyboard Codes." It gives you many helpful keycode charts showing how to read [SHIFT] key, [CONTROL] key and even [CONTROL]-[SHIFT] key presses. Special keyboard registers for inverse and [CONTROL]-[SHIFT] lock are explained. Even the little-known 1200XL function keys are covered. It also shows how to convert your computer to a Dvorak keyboard. This and "Blinking Characters" cover the interface with the keyboard and text display very well.

An interesting graphics utility is titled "Super TextPlot." This USR routine allows you to put text anywhere on a Graphics 3-8 screen (it's mainly written for Graphics 7) in any of three colors, at any angle of rotation. Multiple size characters can be printed on the screen. You can even specify the characters as overwriting graphics or merging on the screen with it.

The cover claims this book is "XL Compatible," which is not entirely the case. "The Wedge," a utility for adding immediate mode DOS commands to Atari BASIC, is *not* XL compatible. The utility makes an illegal call to the Atari Operating System to the entry point for the get character routine (like GET #1,A). It's one of the routines that was moved in the XL/XE computer systems, as documented in *Exploring the ATARI XL,* **Antic**, June 1984.

I'm sure "The Wedge" would be quite frustrating for any XL/XE owner who takes the time to type it all in only to have the computer lock up. It will run with a Translator disk of some sort, but I hardly call that XL-compatible.

Those of you who have any Atari XL computer will find the "1200 Memory Map" a useful reference. It was written by Ian Chadwick, author of the authoritative book *Mapping the Atari.* However, it is only 15 pages

continued on page 49

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long and not complete or up-to-date for 800XL and XE owners.

I found that this compilation of COMPUTE!'s better Atari articles made it easier for me to throw away four years' worth of back issues that were taking over my computer room. The articles are informative, although not all are timely. As with COMPUTE!'s First and Second Atari books, you'll see material here that cannot be found anywhere else. I recommend this new volume, even if only to complete your set.

MICROMOD

Micromiser, Inc.
1635-A Holden Avenue
Orlando, FL 32809
(305) 857-6014
Requires 1050 disk drive
$19.95, 48K disk

Reviewed by Stephen Roquemore

Micromod is a useful program for owners of small businesses who want to get started in computing with a minimal investment. The software defies categorization. It is not just a record-keeping program, although in this respect it is very capable. It is not a real inventory program, although it can serve this function with the extra modules available from the publisher.

Micromod is so flexible that you can do almost anything with it in terms of designing your own record layouts.

Its power lies in the record-design function providing a package which can be used to track most or all of a small business' records. It can provide for accounts payable and receivable, invoices, payroll (with the additional modules available) and other necessary functions.

A $5 demonstration disk helps you get started using the program before entering your own data. The manual is readable, but by no means fancy.

According to the publisher, Micromod requires an Atari 1050 disk drive if you are using a single-drive system, but it will work on any disk drive if you use two drives or more. It uses the full 130XE RAMdisk, and the program is not copy-protected.

I can recommend Micromod to small business owners who want to get the most record processing power for the least money. However, they will need some understanding of computers to get started. The manual is not adequate for an absolute beginner.

(As this issue went to press, MicroMiser Software informed us that their latest revision of Micromod—version 3.0—addresses a number of the criticisms made by the reviewer. According to the manufacturer, some of these improvements include: a more complete manual, single and double density support, more standard accounting formats, faster access time. —ANTIC ED*)*

STARTING OUT
continued from page 40

One final note about functions. As you may have noticed from the various examples, you may use functions within functions—that is, **nesting** functions:

10 Z=SQR(ABS(SIN(LOG(COS(20)))))+2*4 is perfectly legal.

AN EXPENSIVE CALCULATOR

This month's listing is a calculator program that makes your Atari perform a function it's vastly overqualified for—manipulating numbers just like an inexpensive pocket calculator. The program also demonstrates how to use variations of the math functions discussed in the column. It does the standard five arithmetic functions, as well as trigonometric and transcendental functions.

Type in Listing 1, NEWOWN5.BAS. And by now you should be able to check it with TYPO II, following the instructions at the beginning of the Software Library listings. Be sure to SAVE a copy of NEWOWN5.BAS before you RUN it.

To select numbers, just move the cursor around with your joystick, and press the button to select a number or function. The intermediate and final answers will appear in the calculation window of the calculator. If you make an error (like trying to divide by zero), the calculation window will read ERROR. You will then have to CLEAR the calculator and start your calculation over again. Study the listing to see examples of how to program with the math operators and functions. There are several items you have not yet seen, like **arrays** (such as NUMPAD$). Don't worry, these will be covered in a future column.

*Beginning programmers will find more information about topics covered in this column in Lon Poole's book, **Your Atari Computer**, $17.95 from Osborne/McGraw-Hill Publishing, Berkeley, CA.*

Listing on page 97

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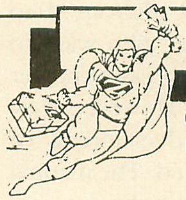
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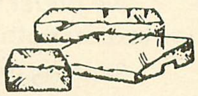
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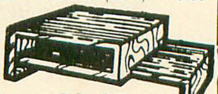
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THE ST RESOURCE

ANTIC JULY 1986









CONTENTS

Reviewed by DAVID PLOTKIN

EASY DRAW

Object-oriented ST drawing software

EASY DRAW
Migraph
720 South 333rd Street, Suite 201
Federal Way, WA 98003
(206) 838-4677
$149.95
(Requires TOS in ROM and Epson-compatible printer)

Easy Draw turns the Atari ST into a drawing workstation and produces printed output of first-rate quality. It is not as sophisticated as a true computer-aided drafting (CAD) program, but Easy Draw is excellent for simple drafting tasks such as mechanical drawings and floor plans.

The first "object oriented" drawing program for the Atari ST, Easy Draw uses objects—geometrical shapes such as circular arcs, polylines, and squares—as visual building blocks. You expand, shrink, stretch and stack these blocks to build a final drawing on the screen.

Easy Draw is very similar to the yet unreleased GEM Draw (a program similar to MacDraw on the Apple Macintosh). What sets Easy Draw apart from these other drawing programs is not the program itself, but the end result—a useful, high-quality final printout.

It's also the first program to take advantage of metafiles and G-DOS from Digital Research. These features make Easy Draw potentially capable of very high resolution graphic output to cameras, plotters and other devices once the necessary interfaces become available.

Excellent documentation, ease of use and utilization of GEM combine to make Easy Draw a significant new program for the ST

USING GEM

Easy Draw makes excellent use of the ST's GEM interface. You really never have to use the keyboard, which makes the program easier to learn and use. All major items are available from drop-down menus, and all drawing and selecting is done with the mouse.

Changing your drawing tool is simple. When you press the right mouse button, the tool menu appears on the screen wherever your mouse pointer is located. Point and click, and you are using a different drawing tool. The left mouse button also controls sizing. The right button selects between modes and pastes down figures you have drawn. You can have two windows open at once so that you are working on two drawings, which can be saved or printed separately. There is a clipboard for saving shapes temporarily, and a trashcan for discarding shapes you no longer need.

EASY DRAWING

To start a picture, you choose how big the final picture will be, and the working area on the screen then becomes as large as the size of the paper. Under normal magnification, you can only view a portion of the total page on the screen at one time, but you can scroll around the page using the scroll bars and arrows, or zoom back to view the whole page as a reduction. Or, zoom in on a section of the screen for fine detail work.

Using the mouse, place various types of geometric shapes on the

continued on next page

screen and form a picture or diagram. At any time you can re-size, move, or rotate the shapes to get the desired effects. You may also place text on the page, taking advantage of various sizes and options such as italics, underline, and boldface type. Different colors and fill patterns, including patterns you design yourself, are available. Although the manual doesn't say so, Easy Draw only works in the ST's high and medium resolution modes.

To help you in alignment, there is a ruler display, complete with selectable spacing, and you can turn on a grid. Both the ruler and the grid will reflect different spacing if you zoom in on a section of the drawing, thus keeping everything accurate.

When the drawing is complete you can save it and print it out. The quality of the print on a dot-matrix printer is superb, using the highest resolution my Star Micronics SG-10 printer can handle.

DRAWING TOOLS

The multitude of drawing tools includes lines, free hand sketch, polylines, circle and elipse, square, text and circle segments. Once you have chosen a shape, you adjust its size on the screen, place it where you want it, and paste it down. A sizing box appears around the shape so you can see exactly what you are doing. You can change the size at any time, stretch the object in any direction, change the color or swap for one of 32 different pattern fills.

From the Edit menu, you can Delete and Undelete, Copy, Rotate, and Shadow. Shadow gives a nice three-dimensional effect. Or go back and edit text already on the screen at any time, including changing the size, options, and colors.

With the Arrange menu, you can put objects in front of, or even behind other objects. One of the most important features in Easy Draw is the ability to group many objects into a larger object. Once the larger object is created, you can size, stretch, recolor, move and fill it as a single group.

You can disassemble the larger object back into its component parts, or temporarily associate many small objects and align them in a variety of ways. (As we will see later, this is sometimes the only way to get text and graphics to line up.)

Finally, a variety of line styles (thickness and texture) are available, and you may change the line style of any figure at any time.

Once you have created a picture, there are two file formats for saving it. One format will retrieve the file so you can work on it at a later date. The other is a special format for printing. But, if you are going to print a file and work on it, you must save it both ways. Fortunately, Easy Draw will save it both ways automatically if you tell it to.

FIRST-RATE PRINTOUTS

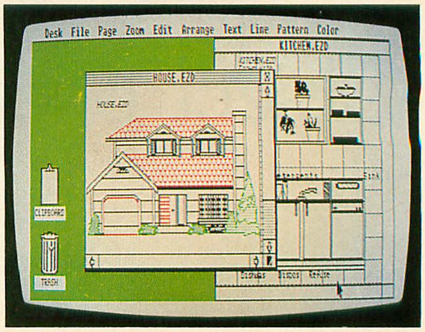
You can print out in draft mode—fast, but alas, rough draft quality. Producing a final quality draft takes a *long* time, but the results are beautiful, and the dot-matrix dots are virtually invisible. First you must load a special output program that constructs a list of drawings to print (the list can be saved and reloaded later). If you are printing an 11×17 inch or 8.5×14 inch picture on 8.5×11 inch paper, the program will even print the picture on multiple sheets which can then be pasted together.

With Easy Draw, you can print the picture horizontally or vertically. Even print out oversize pictures on 8.5×11 inch paper without using multiple sheets—the program does the scaling. *(Unfortunately, Easy Draw currently only works with Epson FX-80 compatible printers. It is compatible with the Star Micronics SG-10 printer* if *set for the IBM mode. We advise contacting Migraph before purchasing this product to see if other printer drivers have become available.*
—ST RESOURCE.)

What sets it apart from other drawing programs is not the program itself, but the end result—a high quality final printout.

METAFILES

Easy Draw is the first ST program to take advantage of a powerful feature in GEM called "metafiles." Usually a printer prints exactly the same picture



that appears on the screen. But metafiles allow the computer to take advantage of the highest resolution that the output device (such as a plotter or printer) is capable of. Thus, the printed resolution is essentially independent of the screen resolution.

Currently, only the dot matrix printer option is operational, although other choices appear on the output menu. Migraph is waiting for the various device drivers for non-Epson printers, cameras, plotters, and laser printers to become available from Digital Research (the makers of GEM). **Antic** has ben assured by Migraph that if the device drivers do not become available soon, they will write the drivers themselves.

(*For detailed information about Metafiles, read Tim Oren's article on Metafile structure in Volume 1, Number 1 of **START**, the ST Quarterly.*
—ST RESOURCE)

THE OTHER SIDE

It's a very powerful package, but Easy Draw does have limitations. Although it has some freehand drawing capabilites, it is not a paint program such as DEGAS or GEM Draw. There is no way to do pixel modifications, so all shapes must be built up from the geometric drawing tools. Constructing

detailed pictures is difficult at best.

It is also not a professional-quality drafting package. It lacks such features as rotation by degrees and only supports rotation in 90 degree increments. You can rotate a figure, but you can't rotate the pattern fill and text. Thus, although the package claims that EasyDraw can be used for doing greeting cards, it really can't.

Easy Draw apparently uses the GEM fonts to draw text on the screen. When you zoom in on a section of the screen, the text will be enlarged to the nearest available size. As a result, the size of the text is not accurate in zoom mode, and attempting to line up graphics with a line of text is a frustrating experience. One of the examples in the manual, (setting up a telephone message form) requires that you try to line up the little boxes on the form with text. The way you accomplish this task is to group the line of text and the box into a single object, then choose Align Bottom from the menu. Snap moves objects to the nearest point on the grid. This will help when designing forms.

It is awkward to select a figure contained by another figure the size of the screen, because if you select the outside (screen-sized) figure by accident, there is nowhere to point and click to remove the outside object and try again. When using two-screen mode, you can't use full screen windows, because when you draw in one window, the other disappears behind it. You will then have to shrink the top window in order to point and click on the back window, bringing it to the front. The manual doesn't warn you of this, and the first time window 2 disappears when doing one of the early examples, it may take a while to figure out where it went!

The Output program also has a few problems. It can't be run unless you boot up with the Easy Draw master disk, but there is no warning in the manual. Also, following the manual's instructions for moving file names around the list of files to print will cause the computer to lock up. Still, this was the only bug I found in the whole package, and it can be worked around.

There is an option in the Output program which looks interesting, but does not appear to be functional yet: "Print in Backround". It could be *very* useful if it allows you to continue working while your picture prints. Perhaps in the next update?

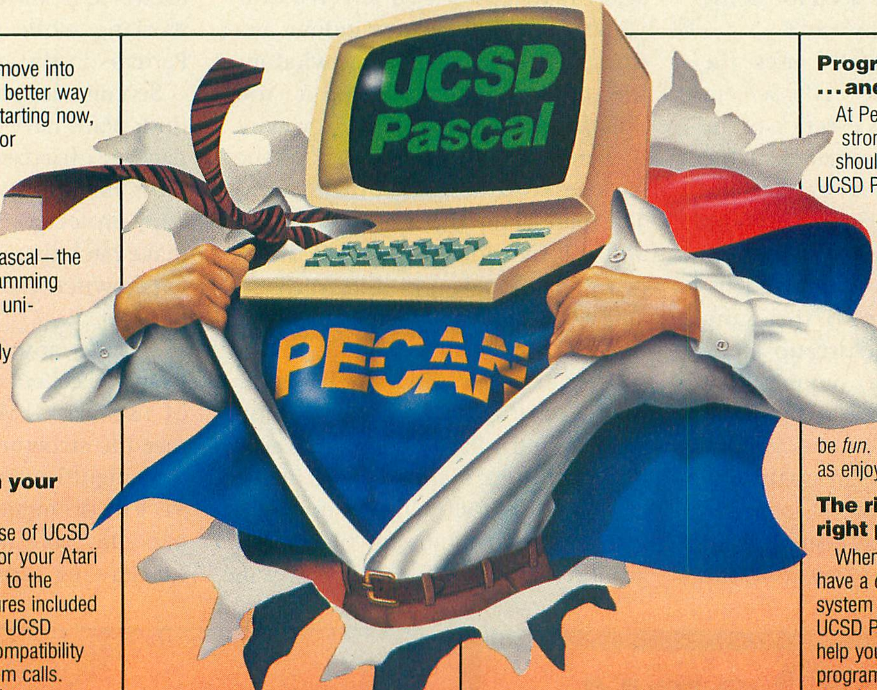
Several example files of drafting and floor plans have been included in the package on a data disk. Neither of the disks included with the package is copy protected, and you are urged to make backups. However, only registered owners can obtain the promised updates.

Despite any shortcomings, Easy Draw's excellent documentation, ease of use via GEM and utilization of metafile structure combine to make this a significant new program for the ST. I recommend Easy Draw to anyone who has a need for its mechanical drawing capabilities.

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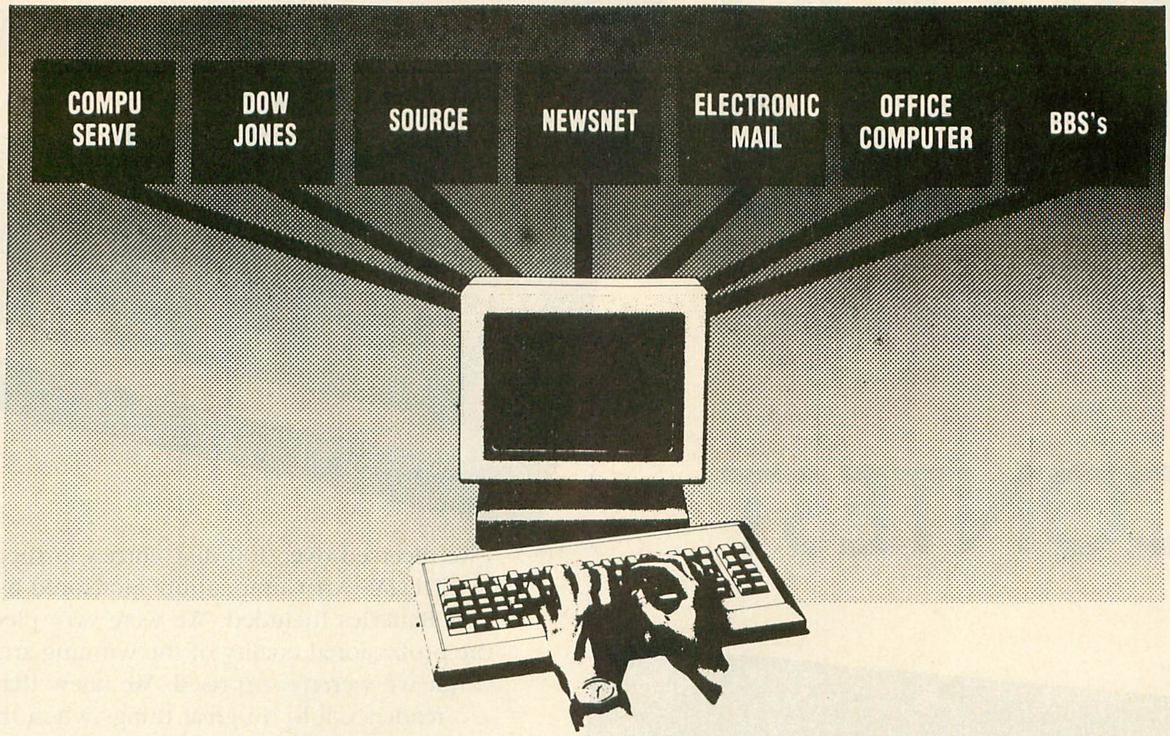
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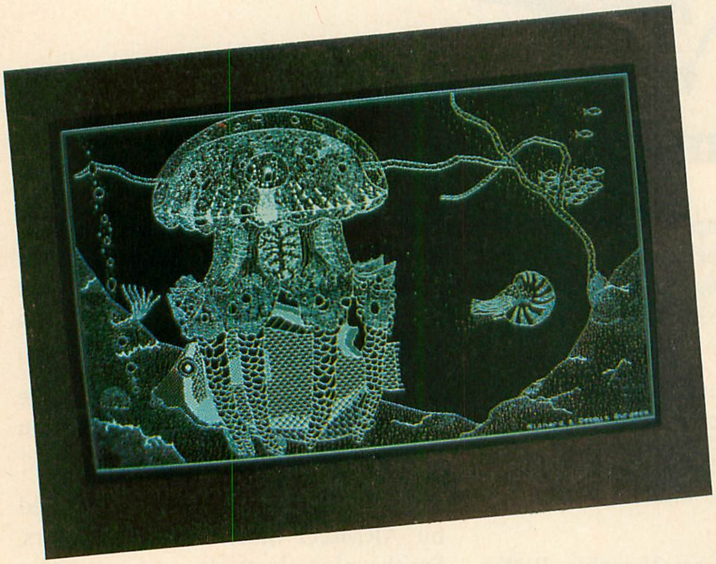
The Winners

$2,000 DEGAS ART CONTEST



We received over 100 disk entries in the $2,000 DEGAS Art Competition sponsored by **Antic** and Batteries Included. We were very pleased by the professional quality of the winning artwork—but we weren't surprised. We knew that **Antic** readers could do great things when they had Batteries Included's DEGAS painting program and the Atari 520ST to work with.

Most entries took advantage of the ST's 16-color palette in low resolution. However, the color grand prize winner was one of the few screens submitted in four-color medium resolution mode. **Antic's** judges awarded the $500 prize to Darrel Anderson, 32, of Colorado Springs for **Stoneage**, in recognition of this picture's elegantly detailed control of texture and shading as well as the creative originality of the composition.



The $500 monochrome grand prize went to **Seascape**, an imaginative and meticulously detailed white-on-black undersea fantasy by Deborah Burgess, 32, of Lorton, Virginia. Both grand prize winners also receive three choices of ST programs from the Antic Catalog and three more from the Batteries Included product line, plus one-year subscriptions to **Antic** and **START**, the ST quarterly from **Antic** Publishing.



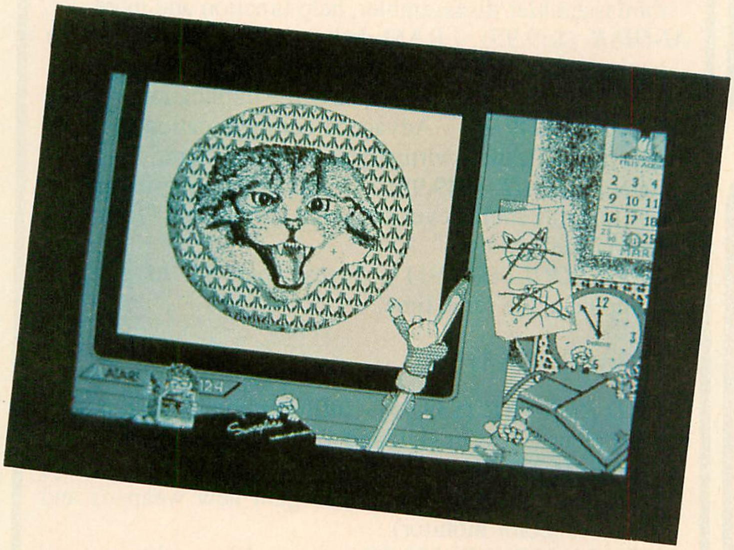
Each of the five runner-ups listed below wins one choice of ST software from the Antic Catalog and one choice from Batteries Included plus one-year **Antic** subscriptions to **Antic** and **START.**



Cougar
A lifelike, finely textured, piece by Judy Wyckoff, 25, of Bloomington, Minnesota.

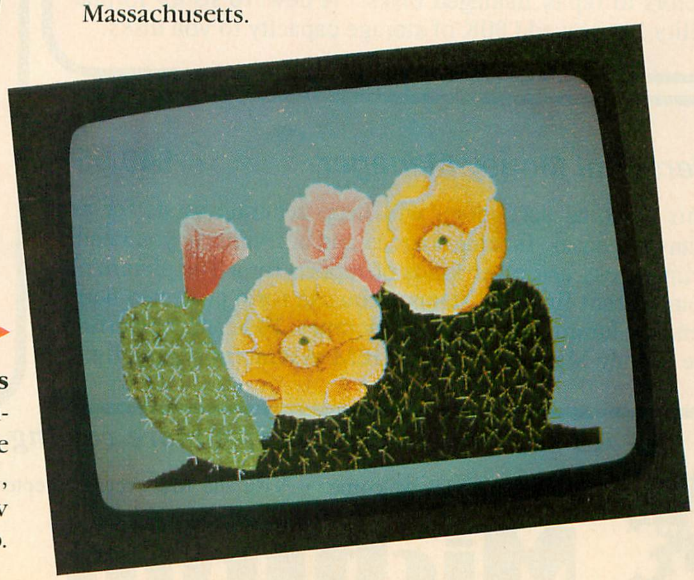


Sunset
A colorful, energetic cityscape by Parker McGee and Virginia Neuman of Fillmore, California.



Helpers
The only monochrome runner-up, a richly detailed illustration that seemed to reveal more comic touches every time we looked at it. From Steve Rehrauer, 25, of Sutton, Massachusetts.

Phido
A wildly-imaginative surrealistic dog by Rick "Bindu" McGonigle, 28, of Oshkosh, Wisconsin.



Cactus
A delicately traditional floral still-life by Kathy Birch, 24, of Albuquerque, New Mexico.

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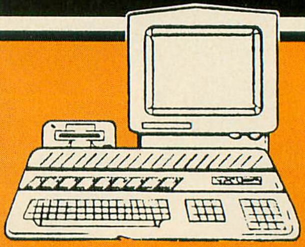
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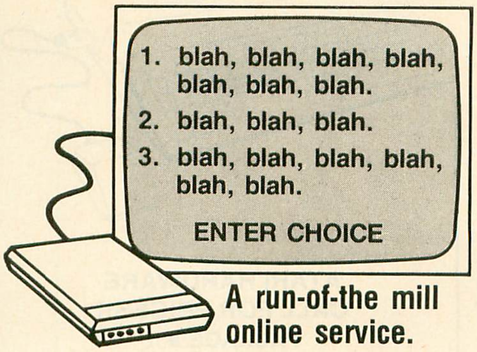
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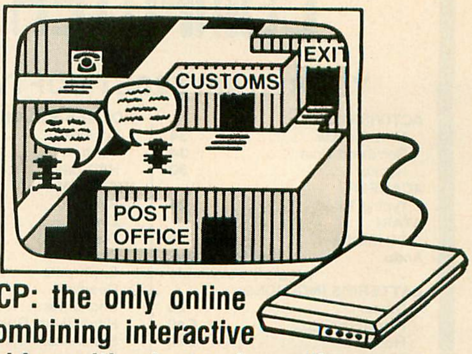
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All other online services are out-growths of business information services. GCP was designed from the ground up to be a service for home computer owners. This means that GCP is easy to learn and fun to use. You can do everything you want with the joystick and function keys on your computer.

In order to provide all these capabilities, we have implemented the entire system using full color graphics. GCP is set up as a City, with buildings for the Post Office, GCP offices, Games and other services. You, and the other customers, are figures which you move around in the City with your joystick.

You mean the City is shown on my TV screen?

Yes, indeed. Not only the City, but the inside of the buildings and the games are shown on your screen in full color graphics. Additionally, the other customers are shown on your screen as they move around the City and buildings.

Isn't it slow downloading the graphics?

No, because we do not download the graphics. All the pictures of the City, buildings and games are supplied on disk. When you go from one building to another, the graphics are accessed at disk drive speeds.

Do I need special software?

Yes, very special. But don't worry, we provide it with your signup.

Can I download public domain programs?

Yes, GCP has a public domain archive in its Post Office with about a Megabyte of Atari programs you can download.

What games do you have?

At the moment, we have BioWar, CyberTank and CyberShip. Lords of Space is under development and may be done by the time you read this. All the games are played online against other customers, so you are matching wits with humans from all over the country.

BioWar is a multi-player adaptation of Conway's game of Life. Each player has a cell colony which he tries to expand, often at the expense of the other players, while contending with the problems of under- and over-population.

CyberTank and CyberShip are tactical design and combat games set on the CyberWorld, an artificial battleground for cybernetic machines. You design your own tank or ship and battle it out with up to 15 other players on a scrolling map.

Do the games use graphics also?

Extensively. For example, in CyberTank, when you design your tank, the hull is shown on the screen, as are all the equipment choices, in full color graphics. You select and place the items by using your joystick.

In the combat phase, your screen shows the status of your tank, the 1 mile area around your tank (only a part of the larger battlefield), and any enemy tanks inside that area.

What equipment do I need?

GCP supports any member of the 8 bit Atari line with 48K of memory. You will also need a disk drive and a modem. We support all the available modems for the Atari.

How much does it cost?

The signup kit includes the software and documentation you need, plus 5 free hours at standard rates. This kit costs $30. After the free hours are used up, the standard rates are $6 per hour (weekday evenings after 6pm local time and all day Saturday and Sunday) for either 300 or 1200 baud access. Daytime hours during the week are $15/hour.

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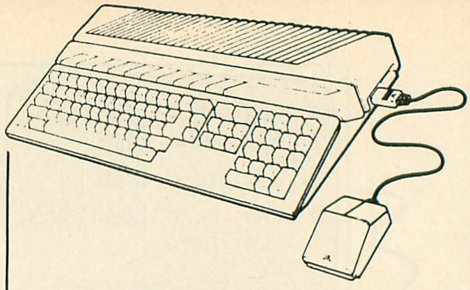
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Reviewed by DAVID PLOTKIN

SUNDOG

The ST game you're waiting for

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$39.95

Sundog: The Frozen Legacy is an outstanding example of what can be accomplished with the Atari 520 ST. The fantasy role-playing game combines graphics, action, simulation and problem-solving in a game with unusual depth that will likely take you months to complete.

The strongest feature of Sundog is its incredible attention to detail. Everywhere you turn, there is something to see and explore. Walk up to a slot machine, and suddenly a window opens to show the machine in multicolored glory. Put your money in and watch the symbols roll by realistically.

Touches like this make the game a constant joy to play. Shoot it out with muggers, or pick up some drugs in the back booth of a bar. Refuse money to a beggar and watch him suddenly get nasty! The list is seemingly endless and I don't want to spoil your fun by telling the many hidden delights I have found.

Sundog's graphics are quite remarkable. Structures in the cities sport an eye-catching multitude of colors. Overhead views of buildings and of the spacecraft are intricately detailed, down to the blinking lights on the panels. You'll fly over realistic views of continental landscapes and oceans.

Sundog is billed as a "ZoomAction" game. When you walk up to something which you need to see in more detail, a window opens on the screen and the necessary detail is provided in high resolution color. For example, walking up to one of the auxiliary instrument panels on Sundog displays that panel. Sitting down in the driver's seat for the pod switches the screen to a top view of Sundog so that you can navigate the pod from an overhead view. And the game is completely mouse-driven, so it's easy to control.

MISSION JONDD

Sundog begins as your uncle dies under mysterious circumstances, leaving you his spaceship named Sundog. Just before he died, he accepted money to complete a contract to deliver cryogens, or frozen colonists, to a new colony located somewhere on the planet of Jondd. The object of Sundog is your completion of the contract.

The manual that accompanies Sundog is purposely vague on quite a few points, since part of the fun is to figure out how to accomplish the many small tasks you will need to master. The first step is to define your character, trading in points of your initial score for attributes like strength, dexterity, luck and intelligence. You start the game aboard Sundog, which is stocked with some supplies, although nowhere near what you will ultimately need. From here, it's up to you.

Your ship will need fuel and repairs before you even can fly her, and you'll need to lay in a supply of food. All

Make sure your guns, lasers and shields are in tip top condition, because space is inhabited by pirates. I hope you're a good shot!

these items are available in the city where you are docked. Sundog is equipped with a small pod which you can maneuver around the city, and you can leave the pod to enter various establishments. I suggest you put the pod in a parking lot, or you will be in for a surprise! There are banks, hotels, parts stores, restaurants, stock exchanges and some buildings I haven't figured out yet. There are also muggers, so be sure to carry your

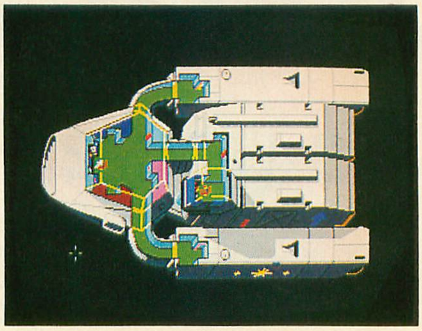
continued on next page

stinger and shield, and have some "rapidheal" handy.

Once you have gotten your bearings, you will need to try to find the colony on Jondd. It's time to hop into your pod and to do some exploring. Since the instructions don't tell you exactly what you are looking for, you will have to figure out when you have found the colony. When you do, you'll be given an indication of what is required (in addition to the cryogens) to get the colony going. You will then have to locate these supplies as well as the cryogens and bring them back to the colony.

OFFWORLD COMMERCE

You will soon find that everthing you need is not located on Jondd. The world of Sundog is huge, encompassing many star systems, some with multiple planets and multiple cities on those planets. A certain amount of mapping will be unavoidable. Your next challenge will be to figure out how to fly to other worlds. The Sundog is equipped with sub-C engines as well as warp drive, and the combination of these will get you to the other worlds you must visit. Before leaving Jondd, better make sure your guns, lasers, and shields are in tip-top condition, because space is inhabited by pirates. I hope you are a good shot!

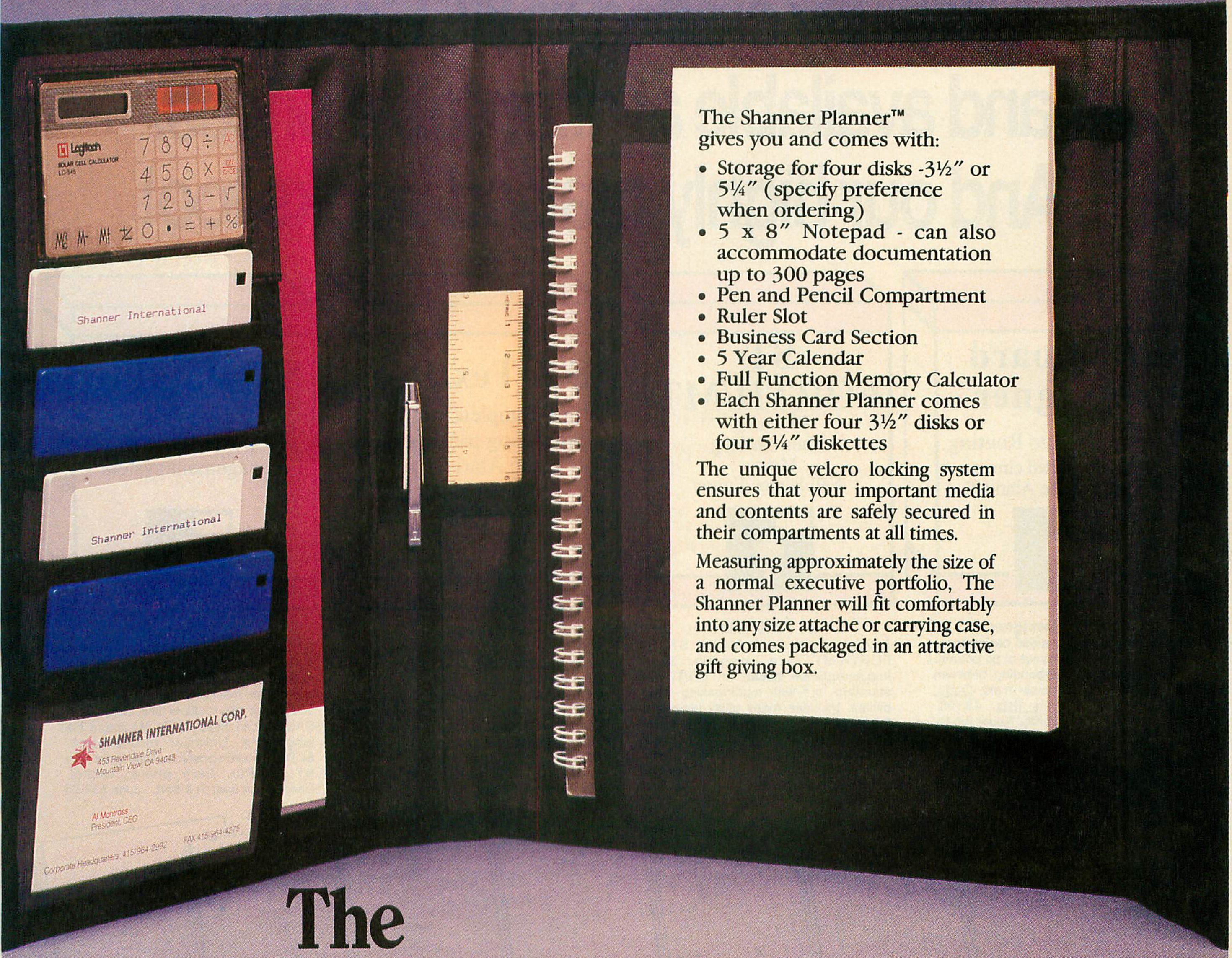


You don't have enough money to simply buy what you need and bring it back to the colony, although that would be hard enough. Your skill as a trader will be sorely tested. To earn the extra money you will need, you must buy supplies on worlds where they are cheap, and sell them where you can make a profit. While this is not too difficult, you will need to keep track of the selling prices of various items on the many worlds of Sundog.

There's a useful option to perform virtually unlimited game saves on a library disk, while your current game is saved on the Sundog disk itself to eliminate disk swapping. Frequent game saves are a good idea in a game of this magnitude, as death can be sudden.

Sundog will take long time to solve. I am writing this review after having solved only a small part of the whole game, and I am looking forward to many more evenings of enjoyment. My hat is off to the programmers, who must have spent tremendous effort to put this fine game together. Sundog sets a new high for "getting your money's worth" in entertainment software. This game will put you completely under its spell.

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by PATRICK BASS, **Antic** ST Program Editor

GRAFCON ST

Universal graphics converter

It all started with one letter to the **ST Resource**. "Please, can you help?" the writer asked. "I bought the Atari 520ST with a monochrome screen and I can't view any of the great color NEO or DEGAS pictures that I've been seeing. Do you know where I could get a picture converter program?"

A quick check revealed that nobody was currently offering such a package, so I decided to sit down and scratch out a small program to convert a color picture to monochrome.

THE 102% SOLUTION

What I wound up with is a large-scale application that performs *two* jobs. First, it will convert any NEO, DEGAS, or DOODLE format picture—in any resolution— into *any other* ST format and resolution. (DOODLE is the graphics program that comes with the ST Developer's kit.)

Second, it will convert any NEO, DEGAS or DOODLE picture into the CompuServe RLE (Run-Length Encoded) format for uploading pictures to CompuServe VIDTEX. Next month, we'll publish a smaller program that converts downloaded RLE graphics into GrafCon-ST format.

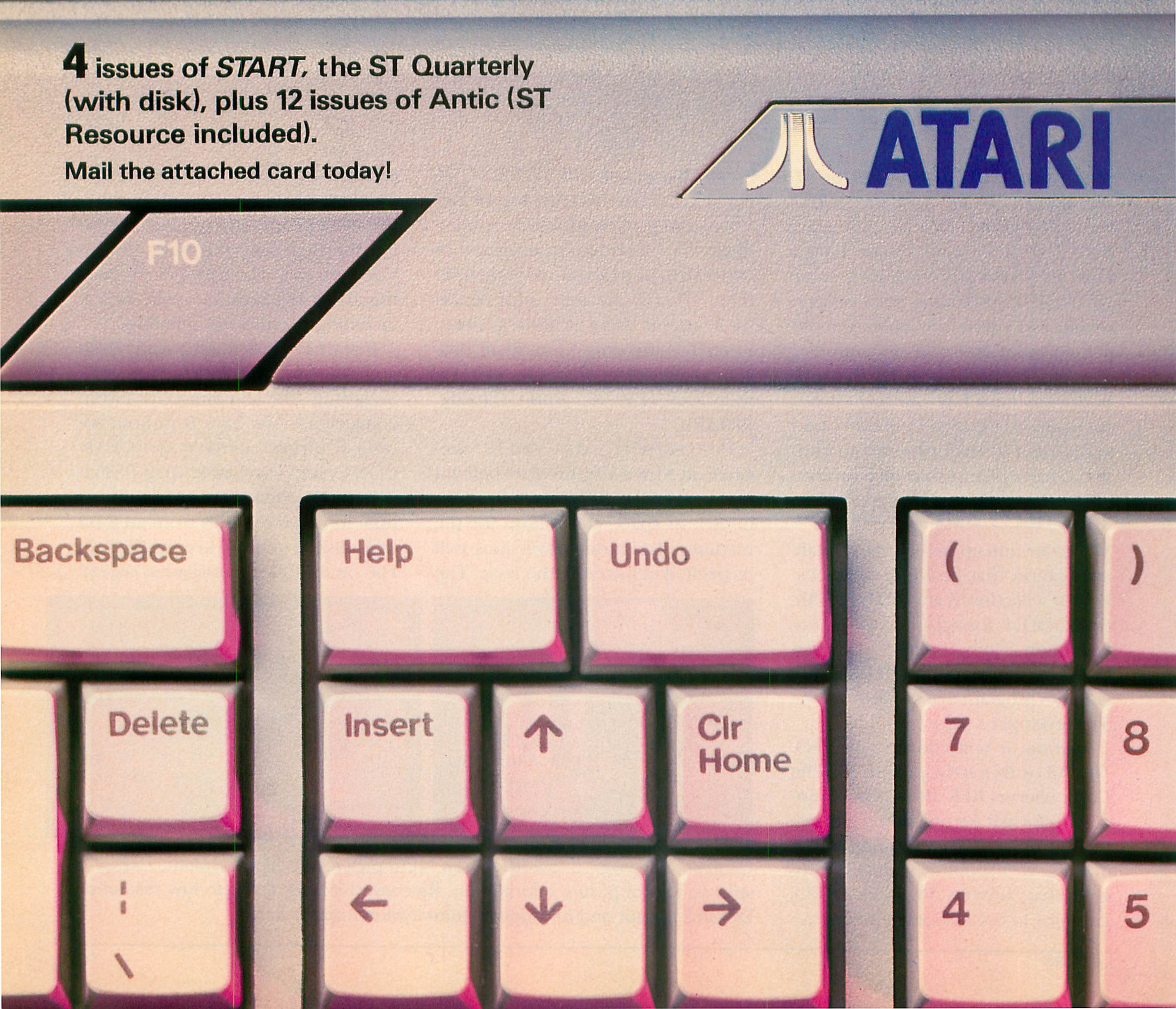
See Charles Jackson's *VIDTEX Converter* article in this issue for the full story about CompuServe's online libraries of high-resolution graphics and instructions about working with them. This is the only information we'll repeat from Charlie's story: **FLASH** is the only ST modem program that currently supports VIDTEX RLE files ($39.95, Antic Catalog, ST0220)

IMPORTANT: As you'll see, GrafCon-ST is a *long* program built up of many small parts (procedures). Due to lack of space, the listings for the medium resolution conversions will be printed in *next* month's issue. The rest of the program works fine without these procedures—and we think that most people will primarily be using the high-low, low-high conversions anyway. For simplicity's sake, this article explains the entire listing, including the missing portions.

If you have this month's Antic Disk, you will find this entire program—including the medium-resolution conversions—on Side B in both Alcyon C format source code (GRAFCON.C) and executable **.prg** format (GRAFCON.PRG). For instructions on how to move the files from an 8-bit Atari disk to your ST, see the ST Help File on Side B. continued on page 69



Grafcon can covert a low-resolution NEO picture into high-resolution DEGAS with no loss of picture information. Re-convert it back down to low resolution DEGAS format and all original colors will reappear intact.



ATARI
F10
Backspace
Help
Undo
(
)
Delete
Insert
Clr Home
7
8
4
5

GRAFCON ST
continued from page 67

CONVERSION COMPLETION

As one example of GrafCon-ST's wide range of format and resolution conversions, this C program can convert a low-resolution NEO picture into a high-resolution DEGAS format picture.

Adding frosting to this cake, GrafCon-ST can perform the conversion with *no loss* of picture information. This feature makes it possible to convert a low resolution NEO picture into high resolution DEGAS, save the picture and then *re-convert* the high resolution picture back down to low resolution DEGAS format—and *all* original colors still reappear intact.

WHY IT WORKS

GrafCon-ST works because *any* Atari ST screen—color or monochrome—uses 32K of memory. Since the low, medium, or high resolution screens are all contained in the same amount of memory, the difference must be in how the picture data is *arranged*.

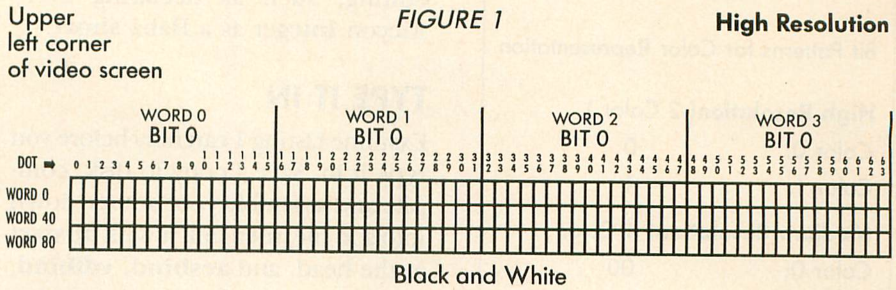
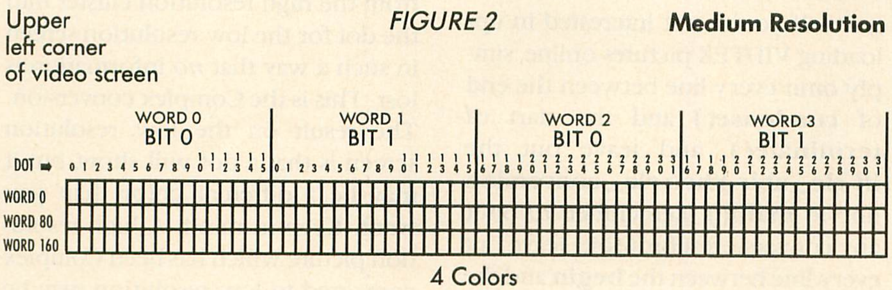


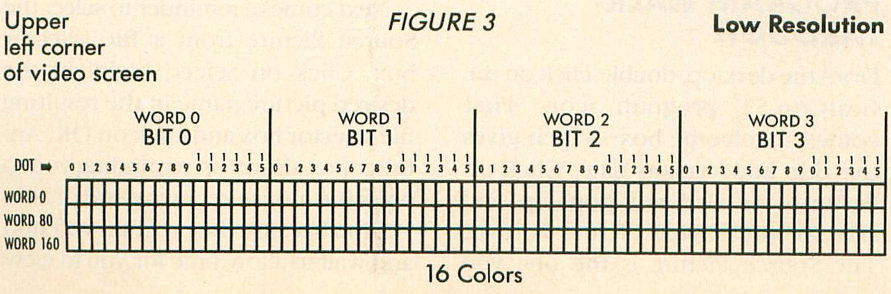
Figure 1 shows how a high resolution monochrome picture uses screen memory. Starting in the upper left corner of the video screen, the 16 bits in word zero correspond to dots 0-15 in the top line. Word number one uses its 16 bits to hold dots 16-31, and so on. Forty words per scan line means 40×16 (640) dots per line. Four hundred scan lines—using one bit for color memory—means screen memory takes 400×40 /1 bit = 16K words, or 32K bytes.

Each dot displayed on the screen corresponds directly to a matching bit in screen memory. Because a single bit can only show whether a dot is turned on or off, we can only display a dot in two colors—black and white.

Figure 2 shows how to interpret screen memory for the four-color medium resolution screen. Instead of two colors, we now need to store information for four colors. To count to four, we need *two bits*, not one bit (as in high resolution).



Starting on the top line, word zero holds the *first* color bit for dots 0-15, and word one holds the *second* color bit for the same dots. Word two holds the *first* color bit for dots 16-31, word three holds the *second* color bit for the same dots, and so on. Eighty words per scan line means 80×16 /2 bits = 640 dots per line. Two hundred scan lines means screen memory takes 200×80 (16K) words, or 32K bytes.



Examine *Figure 3*. For low resolution to show 16 colors, we need to save four bits for each dot on the screen. With four bits we can count from 0-15. The same type of word stacking used for medium resolution is also used here, but for four words instead of two.

In the top line, word zero holds the *first* color bit for dots 0-15, word one holds the *second* color bit for dots 0-15, word two holds the *third* color bit, and word three holds the *fourth* color bit. Word four holds the *first* color bit for dots 16-31, word five holds the *second* color bit for dots 16-31, and so on. Eighty words per scan line means 80×16 /4 bits = 320 dots per line. Two hundred scan lines means screen memory takes 200×80 (16K) words, or 32K bytes.

continued on next page

FIGURE 4

Bit Patterns for Color Representation

High Resolution(2 Color)	
Color 0:	0
Color 1:	1
Medium Resolution(4 Color)	
Color 0:	00
Color 1:	01
Color 2:	10
Color 3:	11
Low Resolution(16 Color)	
Color 0	0000
Color 1	0001
Color 2	0010
Color 3	0011
Color 4	0100
Color 5	0101
Color 6	0110
Color 7	0111
Color 8	1000
Color 9	1001
Color 10	1010
Color 11	1011
Color 12	1100
Color 13	1101
Color 14	1110
Color 15	1111

So that's how the Atari arranges screen memory for each of the different resolutions. All we need to do is figure out how to swap 256,000 little tiny bits around from one format to another.

The program that actually does this for us is contained in Listing 1, GRAFCON.C., written in Atari Developers' Alcyon C. When the upcoming MegaMax C revison that allows text/data segments larger than 32K is available, I see no reason why that product should not also work with GrafCon-ST. Hippo-C owners should try this listing *only* if they have the Hippo-XBIOS package—available for downloading from Data Library 3 in the SIG*Atari 16-bit section on CompuServe. Even with Hippo-XBIOS you will still need to do some extensive editing, such as declaring every Alcyon **integer** as a Haba **short**.

TYPE IT IN

Examine Listing 1 carefully before you type it in. Save a copy to disk, compile and assemble your source down into a **.o** file, then link it with **apstart** at the head, and **aesbind**, **vdibind**, **osbind**, and **libf** trailing along behind. **Relmod** the resulting **.68K** file into a **.prg** file and you're set.

IMPORTANT: As we said before, this long program is built up from many small parts (procedures). So if you feel you don't need all the features in GrafCon-ST, you *don't* need to type them all in! For example, if you personally have little need to convert a medium resolution picture to high resolution, when you get to the routine for converting medium to high—called **medhi( )**— just omit all lines *between* the **begin** and the **end** statement. The program will run fine; it just won't convert medium resolution to high resolution.

Feel free to omit as many conversion subroutines as you desire. If you only need a low-to-high resolution conversion, just type in the **lohi( )** subroutine. This also applies to the RLE conversion section of the program. If you're not interested in uploading VIDTEX pictures online, simply omit every line between the end of **condense( )** and the start of **terminate( )**, and leave out the **if(rle_able)then rle_conversion** line in **main( )**. Remember, to omit any conversion subroutine, leave out every line between the **begin** and the **end** statement lines of that subroutine.

PROGRAM WALK-THROUGH

From the desktop, double-click on the GrafCon-ST program icon. First comes a welcome box, which gives the title and version date. Click on Perform. An alert box pops up, and asks for the Source Picture Format. The Source Picture is the one you want to convert *from*. Click either NEO, DEGAS, or DOODLE. Next comes a box that asks for the Source Picture Resolution. Click either LO, MED, or HI. The next two boxes ask for Format and Resolution information for the Destination Picture, (the one you want to convert *to*).

If you desire to convert from high to low resolution, a fifth question, "Simple or Complex?", is asked. It covers a point that came up during the writing of this program. Normally, when converting from monochrome high resolution to color low resolution, you want as faithful a conversion as possible. Because each low resolution dot corresponds directly to a group of four dots on a high resolution screen, I included a routine that "squeezes" the two top and bottom dots (or no dots) together, then squeezes the resulting top and bottom dot together.

In effect, if any one of the four dots in the original cluster is showing, then a dot will show up in the low resolution picture. This is the Simple conversion, and it *loses* up to three bits of information.

FOLDING BITS

It is also possible to fold all four bits from the high resolution cluster into the dot for the low resolution screen in such a way that *no* information is lost. This is the Complex conversion. The result on the low resolution screen is that a dot will show, but it may be a different color than you want. Keep in mind: A high resolution picture which has been Complex converted to low resolution may be completely restored to high resolution later. A Simple conversion will *not* reconvert back up.

Next comes a reminder to select the Source Picture from a file selector box. Click on Select, highlight the desired picture name in the resulting file selector box and click on OK. Another box shows up reminding you to press the mouse key at the end of conversion because the program will stop and wait to allow time for you to view.

the results. Click on Go, and the program will locate, read in, and convert the picture.

When you want to continue, press either mouse button. A box reminds you to select a filename for the just-converted picture. Click on Select. If you do not want to save this picture, click on the Cancel button in the file selector box. Otherwise select or type in a filename and save your newly-converted picture to disk. In either case, when you're finished an alert box comes up asking if you want to convert another picture. If you do, click on Yes. Or else just click No and then click out through the Thank-You box at the end of the program.

PROGRAM TAKE-APART

Examine Listing 1. The top has a remark block with the title and copyright. The **#include** file which comes next is also found in the MegaMax C package. Below that are **defines**, declarations, and constants, such as the strings that create the alert boxes throughout the program.

The first block of code is **main()**, located right under the strings and **long** declarations. It's very short, and does just what it says. First we **initialize()**, then perform either the RLE conversion or a Graphic conversion. When **finished**, we **terminate()** this application.

The first function below **main()** is **initialize()**. Notice where we get the address of the three different TV screens we'll be using. **Physbase()** will return the address of the first byte of the video screen memory TOS sets up. The ST demands that TV screen memory starts on an even page boundary *plus* 256 bytes. So the mathematics first force a page boundary somewhere in the named 32K byte array (**0xffff00&src_picture**) and then adds 256 to it (**+0x0100**). Before we exit, we are asked what type of conversion we want—RLE or Graphics.

Below **initialize()** and **wait_for_mousepress()** is **select_parameters()**, where we quickly step through the four questions asked onscreen. Notice, however, that if we have asked for a high resolution to low resolution conversion, we ask the fifth question (explained earlier) about whether we want the Simple or Complex degree of conversion.

SEE THE LIGHT

The next function, **read_the_picture()**, is almost an exact copy of the *File I/O Intro* loader we published in **ST Resource** last month. The logic is the same, but here we use it to decide whether to load a NEO, DEGAS, or DOODLE picture file. Before we leave this function, we transfer the just-loaded picture over to the destination picture memory area. So, if no resolution conversion is performed, we'll still have an image to write out.

Next is the master routine that diverts logic flow according to which resolution the Source Picture is in. Following that is the first of the sub-diversions, which will further divert program logic flow according to the Destination Picture type.

Now let's discuss the first of the actual picture conversion routines. This one is called **lohi()** and will convert a LOw resolution picture into a HIgh resolution picture. Since the logic for the rest of the conversion routines follow this one closely, we will examine this function in detail, and use it as a basis for the others. Remember, if you don't need the low to high **lohi()** conversion, omit every line *between* the **begin** and **end** statements.

LOHI()

We start off by declaring three local integer-sized pointers which will eventually point to the source and destination words we will be moving. Just think of pointers as "signposts" pointing to the memory location we're interested in. The leading asterisk * denotes these three variables are to be used as pointers.

Since all pointers in C language are 32 bits long—they are, after all, just addresses—we need to declare the amount that the pointers will be moved up (incremented) when we use the "++" operator. In our case, this means "increment to the next location." As long as we will be pointing to and PEEKing and POKEing integers (16 bits), we define our pointers as **ints**—or pointers to integers. Each time the pointers are incremented now, they will be moved up by 16 bits, or more simply 2 bytes.

Finish the local declarations by saving space for temporary pixel units and the current row and column counters. The first VDI call here is **v_hide_c(handle);**, which will hide the mouse cursor from view and disable it.

USING XBIOS

Next is an XBIOS call, **Setscreen();**. This call sets the location where we are currently drawing or looking, and provides a quick way to change resolution on the fly. Here we point the video screen to **des_pix**, which will flip the display to our destination picture.

Next is another XBIOS call, **Setpallete();**. If you pass the address of a table of 16 color information words to this routine, the ST operating system will slip the new palette location into the palette pointer at the end of the next vertical blank. Presto! A new palette starts being used.

Next we initialize our two pointers, **src** and **upper_dest**, to point at **src_pix** and **des_pix**, which are the addresses of the first word in the upper-left corner of the screen.

Now we begin the two nested loops that will count through the bytes on the screen. We are going to convert from **top** to **bottom**, and from column 0 to column 20 (across the screen). First the line: **hi0_pixword=(*src++);** is just the same as saying: **hi0_pixword=PEEK(src): src=src+2;**. Say to yourself, "**hi0_pixword** is assigned the value in the memory location the pointer **src** is pointing to. Then the pointer is incremented to point at the next location."

continued on next page

After we pick up the four source lo-res pixel words, the next line down will **blend** each pair of 16-bit words together into one 32-bit longword. This "blending" is described below. The result of the blend is returned inside **hi_word** and **lo_word**, which we turn over to **pixhi0** and **pixlo0**. The same operation is performed on the last two displayable words in low resolution, with the blended longword being turned over to **pixhi1** and **pixlo1**.

The three lines below will insert the new blended values into the destination picture. The construct **(*upper_dest++)=pixhi0;** means: **POKE upper_dest,pixhi0: upper_dest =upper_dest+2**. By the way, remember we add two because the pointers were defined as **integers**, *not* because the pointer has two plus-signs after it.

Finally, close the two nested loops, and **v_show_c(handle);** will cause the mouse cursor to reappear.

BLENDABLE BITS

In order to convert two 16-bit words into a displayable 32-bit longword, the individual bits must be "blended" together into Atari format. What this routine does is OR alternate bits in both words together in alternate sequence, with the final longword result being made up of bit 15 left, bit 15 right, bit 14 left, bit 14 right, and so on. Later on, we need to "separate" these bits back out into their original words when we convert from a higher resolution down into a lower resolution. The function that follows **blend()** does just that and is indeed called **separate()**.

All you experienced C programmers out there may shake your heads when you see the blocks of **if. . .then** constructs inside **blend()**, **separate()**, and **condense()**. You may say to yourself, "He should have put that code into loops." I did that at first. However, the loops—two double nested loops each—wound up being one line shorter and bunches slower than multiple **if. . .thens**.

Now we get to **write_the_file()**, which will do the format conversion as it writes the picture back to the disk. Notice each of the different formats has its own block of code that writes the picture information.

DON'T BE CONDENSE

Below the file-writing function is **condense()**, which is provided to make the Simple conversion from high to low resolution. Each group of four dots on the high resolution video screen correspond directly to a single dot on the low resolution screen, so this function simply ORs the two top dots together, then it ORs the bottom dots together, then it ORs the resulting top and bottom single dot together. The result: If *any one* single dot was set in the original high resolution group of four dots, the corresponding single dot will be set in the low resolution conversion.

RUNNING THE LENGTH

Right after saving the picture we get to the RLE conversion section of the program. Once again, if you don't need this section, you don't need to type it in—just follow the special RLE omission instructions in the article's TYPE IT IN segment

The first routine in the RLE section is **rle_conversion()**, which will first ask for the type and resolution of the picture to convert. Then it reads the picture in, allows you to find the area of the picture you wish to convert (because RLE wants a 256×192 grid), converts the picture to RLE format and saves the resulting file to disk.

The following function, **rle_the_box()**, performs the RLE conversion. Details of the conversion mechanics are explained in Charlie Jackson's *VIDTEX Converter* article elsewhere in this issue. This function follows his algorithm closely. **blk_handle()**, **wht_handle()** and **w_record()** are called from inside **rle_the_box()**.

The last function for RLE conversion is **find_area_to_convert()**, which will show a growing box outline, then place the "flattened" hand cursor onscreen. At this point it will wait for you to *hold down* the left mouse button. A rectangle the size of the needed RLE box will appear, and you can *drag* the box around the video screen to select the picture area you wish to convert. When selected, release the mouse button and a shrinking box will show. Then the requested box will be outlined and RLE conversion begins.

SARAN WRAP-UP

Finally, **terminate()** will present a "thank-you" box, close our virtual workstation, and exit the application.

So here is a program to convert any format/resolution picture to any other format/resolution, along with conversion to CompuServe's RLE picture format. Remember, you *don't* need to type in the entire program if you don't need all the features. Pick and choose the routines you need, compile the rest and start converting.

(For details about the graphics software and hardware mentioned in this article, see the Graphics Products SourceList in this issue.)

Listing on page 99

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Reviewed by ERIK GUNDERSON

H&D BASE

dBase II workalike

H&D BASE
Mirage Concepts
4055 W. Shaw, #108
Fresno, CA 93711
(800) 641-1441—Out of State
(800) 641-1442—California
$99.95

H&D Base, a powerful database program from Mirage Concepts for Atari ST computers, is a "work-alike" of Ashton-Tate's dBaseII, possibly the most popular database for the IBM PC and compatibles.

The major difference between H&D Base and simpler "home filer" programs available for 8-bit computers is that H&D Base is a "relational" database. A relational database can manipulate and access related information stored in two or more data files. For example, you could maintain a data file with a list of people, their ages and the clubs they belong to. A second file could contain a list of clubs and their addresses. You could then instruct H&D Base to produce a report listing each club's address and its membership grouped by age.

This sort of feat is possible because H&D Base has a large repertoire of commands, plus the ability to store and calculate intermediate values and totals. The program can also execute "command" files containing a series of instructions. Thus, you could create a command file that uses both data files from the previous example and then prints the membership report.

When H&D Base is opened from the desktop, it enters either high resolution (monochrome monitor) or medium resolution (color monitor). The user interface mimics dBaseII faithfully, so no use is made of the GEM menus, window graphics, or mouse. Moving around the screen and editing requires use of the arrow keys and codes like [CONTROL] [W].

> Release 1 of dBase II was described as "bug ridden," but H&D Base has relatively few bugs for a program of this complexity.

When the cursor appears in the upper left corner of the screen, H&D Base is in "command mode." Anything typed is interpreted as a command and an attempt is made to execute the command immediately. The program returns either an "ok" prompt for successful execution, or an error message.

While in the command mode, you can create a new database, append or edit records in a database, sort or index a database, or create formats for printed reports, including totals and subtotals.

When you create or edit a command file, H&D Base puts you in a simple text processor and the commands are typed in, one per line. It is also possible to create command files using your own word processor. You simply save the document as a text file and execute it within H&D Base.

INDEXES

Records can be added in any sequence but are still accessed alphabetically by using an index. It is possible to maintain several indexes for one data file. For example, a mailing list could be indexed separately by last name, ZIP code and last mailing date. You can also index on a function of a key field.

Several commands have been added to accomodate the Atari ST environment, including "create folder" and "set folder to . . ." commands for manipulating disk folders. Other new commands are "set color" (for color monitors) "set decimal to n" (default decimal places in a report), "set forth" (turn Forth interpreter on/off) and the "blank string" command, which fills a string variable with spaces.

continued on next page

The one difference I found irksome is that you cannot abbreviate the first command word on a line. dBaseII requires only the first four letters of any command key word. For example, in dBaseII it is legal to shorten the command "display structure" to "disp stru." In H&D Base you must type "display stru" or "display structure." However, it is possible to customize the command names by using the Forth interpreter. The following series of commands will create a new command "d" that is an alternate to "display":

```
set forth on
: d display ;
set forth off
```

This can be stored permanently by entering "turnkey start," which stores the modified H&D Base program to disk. With this technique, users can customize the command set to their personal preference.

FILE TRANSFERS

H&D Base can read in files using the dBaseII formats of "SDF" or "DELIMITED." This includes command files, which are always in SDF format. Therefore it should be possible to transport database applications written for dBaseII to H&DBase. Transmitting the files by modem from another machine would not be difficult. Both SDF and DELIMITED formats can be transmitted as text files. Many powerful dBaseII applications should thus become available for H&D Base on the ST.

The documentation is well written and includes instructions for backing-up and starting the program, a series of tutorials, a reference section, several appendices and an index. Each command is described in alphabetical order, along with numerous examples. I only wish Mirage included an appendix summarizing the different disk file extensions used by H&D Base for various file types.

H&D Base is written in the Forth computer language, and the publishers have generously included a Forth interpreter on the disk. Programmers familiar with Forth will be able to access the interpreter inside H&D Base and add new commands to the vocabulary.

Using the Forth interpreter, it is possible to create database applications that use the GEM interface. I received a demonstration disk from Mirage that used menus and a window. They plan to include the GEM demo on future copies of the program, so all purchasers will have a working example. However, this option requires competence with both Forth and the ST GEM function calls.

H&D Base has relatively few bugs for a new release of this complexity. In contrast, the first release of dBaseII was frequently described as "bug-ridden" and early users had to work around the problems. The most serious problem that can appear in a database program is one that causes a loss of data. In the current version of H&D Base, this disaster can occur if you change the default drive or default folder immediately after appending records to a file.

It's not for the novice, but advanced users will find the potential of H&D Base very attractive.

New records are initially stored in RAM, and changing the disk drive or folder will make H&D Base unable to update the data file. To avoid this problem, always use the "clear" command before changing the default drive or folder. It is also necessary to enter "set folder to /" whenever you change the default drive to make sure you access the root directory of the new disk drive. Finally, the "list files on x:" command resets the default drive. (For example "list files on c:" sets the default drive to c:) This could be dangerous when appending records.

MIRAGE SUPPORT

Mirage is committed to supporting H&D Base. They are actively correcting problems and were interested in the bugs noted above. As Mirage finds and fixes problems, they send out update sheets to registered users, describing the problem and how to fix it. Purchasers can patch their own copies of the program using the Forth interpreter by typing in several lines included with the update sheet. This mechanism assures registered users that they can easily maintain their software without the hassle of mailing in disks or paying for updates. Mirage also plans to start a modem bulletin board for H&D Base users.

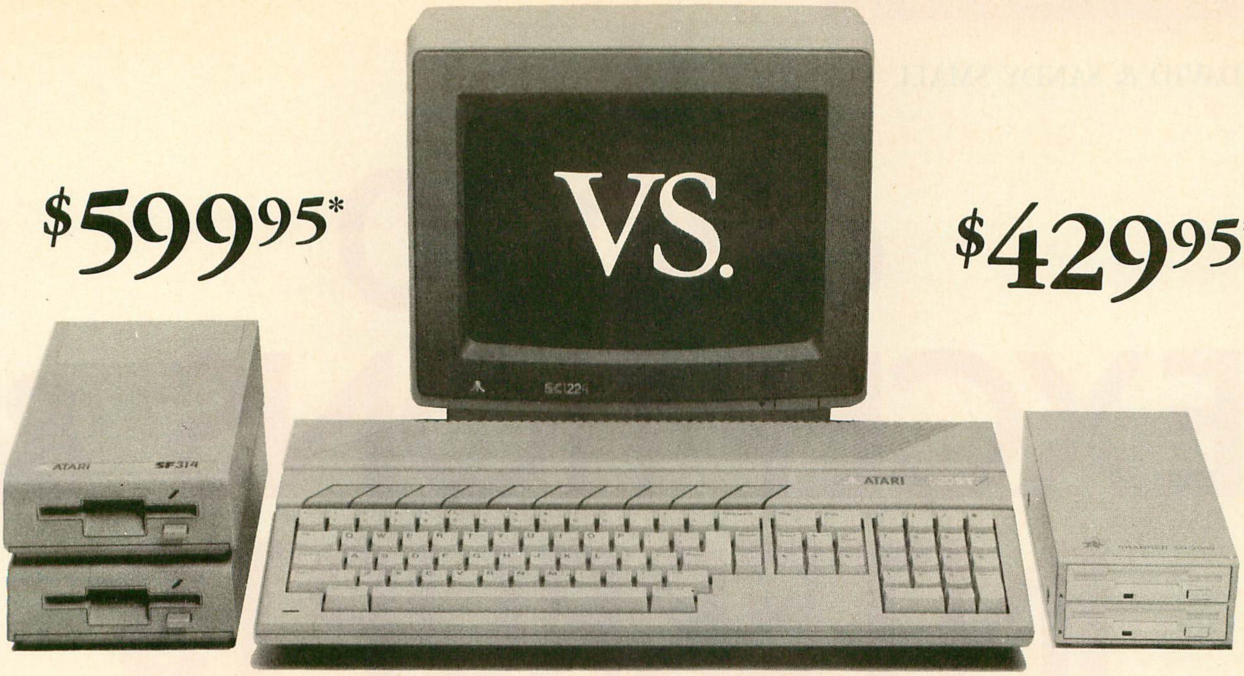
H&D Base is not copy protected, an important consideration to advanced users who legitimately need to maintain backups of the product.

H&D Base is not for the novice computer user. Intermediate users will be able to create and update databases conveniently. Advanced users will find the potential of H&D Base very attractive. Overall, I am impressed by the program and by Mirage Concepts' apparent commitment to technical support.

*H&D Base is the second product in Mirage's Holmes & Duckworth Micronomists line of ST software. It is written in the H&D Forth programming language reviewed in June, 1986 **ST Resource**, page 90.*

—ST RESOURCE.

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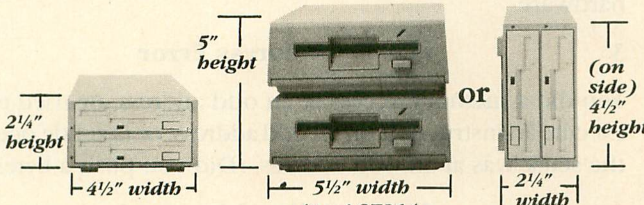
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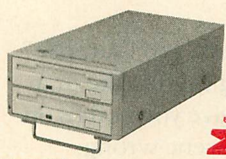
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by DAVID & SANDY SMALL

68000 EXCEPTIONS & INTERRUPTS

Part 3: Bomb handler, TRAPS

This is the conclusion of a three-part series providing advanced programming information about how the ST's 68000 microprocessor handles "exceptions" to normal processing. The first two installments appeared in the May and June, 1986 issues of **ST Resource**. All interrupts on the 68000 are classified as "exceptions" to normal processing. Some exceptions indicate hardware faults. Others indicate software problems. Finally, some are interrupts which we discussed in the previous two issues.

All three types of "exceptions" send the 68000 off to an exception handler. (An interrupt handler is just a type of exception handler). The vectors (addresses) of these handlers are in locations $00—$13C on the Atari ST.

SURPRISE BOMBS

Exceptions come in two flavors— planned and "surprise" The planned exceptions do something useful, like drawing onscreen. The surprise exceptions give you bombs onscreen, letting you know something went wrong.

If you make one of these planned exceptions, you'll meet the System Bomb Handler. This handler will display the exception number onscreen as *bombs* and then direct GEM to try to restart. To determine the exception number, just count the bombs. The bomb handler also saves crash information in memory for you to look at. See *ST Crash Clues* in the February, 1986 **ST Resource**, for more on this.

If you look at low memory, you will see that most of the exception vectors take you straight to the bomb handler. A typical disaster could be something as simple as dividing by zero, or trying to write where no memory is available.

In the table below, the system bomb is the *default* handler. Unless the operating system installed a specific handler to do something, an exception will result in a bomb.

ST EXCEPTIONS:

Bomb/Vector#	Address	Description:
2	**$8**	**Bus Error**

You tried to access an illegal area in the memory map and the MMU / GLUE chips let you know by forcing a bus error. Typically, you tried to access hardware directly when not in supervisor mode or tried to access non-existent hardware.

3	**$C**	**Address Error**

You did a memory access at an odd address, or tried to execute an instruction on an odd address, or (a subtle one) the stack was at an odd address. (Did you push a byte?)

4	**$10**	**Illegal instruction**

You executed an illegal 68000 instruction. Commonly used for breakpoints. Very handy. Usually not seen as a bomb.

5	**$14**	**Divide by zero**

Self explanatory. Uncommon.

8	**$20**	**Privilege violation**

You tried to do something that is only allowed in supervisor mode, like **.move** into the status register, or write supervisor RAM. Switch to supervisor mode, try again.

9 $24 Trace

If the trace bit in the status register is set, this vector gets called after every opcode. Very handy for implementing a debugger trace. SID uses it.

10 $28 Line-A trap

GEM VDI uses this for various video drawing functions, etc. No bomb.

11 $2C Line F trap

GEM AES uses this. No bomb.

26 $68 Level 2 interrupt.

Points to hblank handler.

28 $70 Level 4 interrupt

Points to vblank handler.

33 $84 Trap #1

GEMDOS BDOS interface. This is high level I/O, things like: "Get a line from the keyboard" or "write a file to disk."

45 $B4 Trap #13

Atari BIOS. This handles GEMDOS requests and is extremely low level I/O. Things like: "Get one byte from the keyboard" or "Write a sector to disk."

46 $B8 Trap #14

Atari XBIOS. Atari-specific stuff: generally handles requests like "Play some music" or "fiddle with the MFP" or "change colors."

64 $100 MFP 68901

Unassigned interrupts from here to $13C could bomb. Did you accidentally enable an MFP interrupt and forget to give it a handler address?

CATCH-22

The first 8 bytes of memory (locations $0-$7) are quite special to the 68000. When the system is RESET, either by powerup or by pressing the [RESET] button, the 68000 sets its Supervisor Stack Pointer to the value found in $0-$3. It then sets the program counter (PC) to the value found in $4-$7. You can find where the system RESET routine is by looking at $4.

However, there's a Catch-22 here. The 68000 is trying to read "Where do I begin?" from RAM. And RAM is *not* yet initialized when the system powers up. On the Atari ST, unless you initialize the memory controller chip, even RAM physically present on the machine will not respond to you.

Atari solved this problem by "shadowing" the first 8 bytes of memory to system ROM. Shadowing means the first 8 bytes of RAM are really ROM— you cannot write to them. If you try it, a bus error will result. The 68000 grabs its initial SSP and PC from ROM. If you look at the start of ROM at $FC00 0000, you'll see these same 8 bytes.

<Hacker Note>: SID, the debugger, switches into supervisor *any* time it attempts to access low memory or hardware locations. When finished it switches back to user mode. That's why SID can "see" low memory without getting an error.

SUPERVISOR VS. USER

In the 8-bit Atari machines, the user (you) had endless power. You could do anything—if you knew what you were doing. The machine didn't try to prevent you from causing problems or crashing it.

The 68000 has a feature that's going to be new to you. You can be a "supervisor" who can basically go anywhere and do anything, or you can be a "user."

Being a user means that you are restricted from anything having to do with the hardware, the exception tables in low memory, any memory address that isn't RAM and a few other things.

Why all these restrictions? They were built into the 68000 architecture to—believe it or not—help make it "bomb proof." A casual user can be locked out of hardware access and be prevented from damaging the system, either accidentally or deliberately. If you're in the user mode—which you are when GEM powers up— there are some things you simply cannot do. If you try, you'll get a Privilege Error.

If you're a supervisor, however, you can do anything. On the other hand, you are not protected from your mistakes.

This is entirely different from the 6502 on the 8-bit computers. With the 6502, you could write directly to the video hardware registers and change colors. But on the Atari ST, you *cannot* if you're in user mode. You'll get an exception if you try. In fact, everything below $800 and above RAM seems to be walled off to the user.

GETTING PROMOTED

So how do you become a supervisor? First, some warnings. You can't stay supervisor and get back to the GEM desktop without crashing. So you need to become a supervisor *only* for the time needed to do supervisor stuff (like hardware tweaking) and then return to user mode.

A user may become a supervisor by setting the "supervisor" bit in the 68000 status register. But you may *not* set this bit from user mode.

Think about this carefully for a moment. You are a user, locked out of the hardware and into a small section of memory. You need to do something the machine will not let you do directly. The answer lies in the fact that the 68000 performs all its interrupts in supervisor mode, and exceptions are nothing but fancy *user-called interrupts.*

Thus, if the user can cause an exception, and the exception vector points to your own code, you may become a supervisor indirectly. However, the exception vector is off limits to you. You cannot alter it directly, but must

continued on next page

use a special BIOS call (#5 **setexec**) to do it for you. So when you cause that exception, you become a supervisor.

Fortunately, there are at least two other ways to perform supervisor work. First, the ST lets us become a supervisor with a special GEMDOS call (#20 **super**) to switch us in or out of supervisor mode. It is difficult to use and you must be careful to restore things the way they were before you became a supervisor.

Second, there's an easier call from Atari XBIOS, (#38 **supexec**). You pass **supexec** the address of a routine that you would like executed in supervisor mode, and **supexec** worries about switching into supervisor mode, executing your code, and switching you out.

LOOKING AT TRAPS

A TRAP is a 68000 instruction which deliberately generates an exception. It is your way of asking the ST for an operating system function. On the 8-bit Ataris, all I/O was handled by a master I/O routine known as CIO. You set up your I/O parameters and did a JSR CIOV. CIO acted as a "black box," did your input and output, and gave you the results.

The JSR CIOV is now a TRAP command; that's just about a direct translation. You have three TRAPS you are likely to use:

TRAP #1: High level input/output. Things like: "Send this string to the modem" or "read me in a named file." This is the sort of I/O where you are insulated from the rigors of the machine's hardware.

TRAP #13: Low level input/output. Things like: "Is there a character ready at the keyboard?" or "send one sector to the disk drive." Pretty heavy stuff, often requiring hardware knowledge.

TRAP #14: Atari ST-specific stuff. Things like: "Set the colors on the screen" or "wait for Vertical Blank."

Consult the Atari Developer's documentation, or *Atari ST Internals* published by Abacus Software, for more details about what all the various TRAPs do and what their parameters are.

I hope the information in this series has helped bridge some of the gaps in the Atari ST Developer's documentation, which assumes previous expertise in the 68000.

ST PRODUCT NEWS

ST reviews

PRINTMASTER

Unison World, Inc.
2150 Shattuck Avenue, Suite 902
Berkeley, CA 94704
(415) 848-6666
$39.95

Reviewed by Gil Merciez

PrintMaster is a graphics printing package that allows even the least artistic ST user to design and print superb greeting cards, signs, letterheads, calendars, and banners. If you think this sounds remarkably like Broderbund Software's Print Shop ($49.95) for the 8-bit Ataris, you're right.

The Screen Magic option that generates kaleidoscopic half-page patterns is the only Print Shop feature missing in PrintMaster. Most other features are enhanced from the original Print Shop. And PrintMaster offers the same foolproof user interface that made Print Shop one of the most successful home applications ever.

Just about everyone could find a good use for PrintMaster, whether you'd like to design a flyer for a small business or just design a cute greeting card for a friend. Using the mouse or cursor keys, PrintMaster guides the user through a series of easily understandable menus. Operating the program is a joy for both the novice and the seasoned veteran.

The clear documentation includes tips for designing more ambitious signs, as well as pictures of all the graphic icons included in the disk. The first release of PrintMaster includes the IBM PC user's guide, with a note that an ST guide can be requested when returning the registration card. There are a few enhancements to the ST program not covered in the IBM documentation.

The PrintMaster disk contains 11 borders, 8 fonts, 111 graphic icons, and 11 graphic patterns to use in your creation. An optional Library Gallery disk adds 140 additional graphic icons. Menu options are provided for adding additional fonts and borders, but no utilities allowing you to create them are present on the protected master disk.

A graphics editor option allows you to design or modify your own picture. The 88×52 grid in which you design your picture is the same resolution as that of Print Shop. I would have preferred a higher resolution for ST graphics. When the icons are printed in a medium or large size they often look too chunky. Today's dot-matrix printers can handle a much higher resolution.

PrintMaster is compatible with just about every popular graphics-capable dot-matrix printer on the market. The specific printers are named on the rear of the package. Installation of your printer driver is done with a main menu option and becomes the default for future sessions.

SIGNIFICANT DIFFERENCES

PrintMaster contains a calendar option that allows you to design either a monthly or weekly calendar with personalized headings, typestyles and graphics. Small reminders can be added to specified dates.

A much appreciated improvement over Print Shop is the ability to add a second graphic to any design option. This improves versatility, particularly if you want to add a picture over one of the pattern icons.

When adding text, you can mix fonts from line to line, as well as change the individual font style and size. Two additional font styles are available, a checkerboard and a rain effect, in addition to the standard, outline and 3-D styles. Upper and lower case letters are supported. I found the text editor to be extremely slow, with disk access that came at odd times and caused me to lose letters.

Banner creation produces solid, good-looking text although the text is a bit smaller than in Print Shop. Completed signs, cards, etc. can be saved to disk.

The standard borders include

continued on next page

with PrintMaster seem to be of higher resolution and more detailed than those in Print Shop. More than twice as many graphics are contained on PrintMaster disk.

A preview mode gives you a chance to look at your masterpiece before it begins to print, which can save both time and paper.

PrintMaster's graphic editor represents a significant improvement over Print Shop. Cursor keys or the mouse can be used to draw either freehand or pixel-by-pixel. I found the freehand format somewhat clunky to use. You must press a key to stop drawing and move the cursor to a different location, even when using the mouse.

You can choose a gray drawing mode and a fill command. You can flip the shape either horizontally or vertically. An invert option flips the colors. An interesting feature is the "window" that does cut-and-paste operations on the graphic.

PrintMaster performs smoothly and is a solid design based on Broderbund's previous winner. Still I do have a few criticisms. It was released just as the TOS ROM chips were becoming available. There is a lot of time-consuming disk access as you cycle through the menus. PrintMaster could have eliminated this if Unison took advantage of the extra 200K memory the ROM chips provide. Also PrintMaster doesn't take advantage of GEM features such as menu bars, windows, etc. This program could have been an outstanding GEM application, providing an even higher degree of user ease.

RHYTHM

(SofTechnics)
Apex Resources
17 St. Mary's Court
Brookline, MA 12146
(617) 232-9686
$39.95

Reviewed by Arick Anders

Rhythm is a drop-down calculator with a twist. The first ST desk accessory created by England's SofTechnics, it combines the features of a programmable calculator with the basic attributes of a 10-cell spreadsheet.

Each cell takes up one row across and has a name column, an expression column and a result column. A row can include the results of any other row by referring to that row by name. By default, the rows are named "A" through "J," but you can give them any name that you want. This means that you can subtract a row named Costs from a row named Income and rename the results Profit.

Rhythm comes with the standard scientific functions you would expect, such as absolute value, natural logs, integer function and trigonometric functions. It also has functions to calculate your compound interest and annuity, and will either round to two decimal places or to the nearest integer.

Numbers can be displayed in either hexadecimal or decimal notation. Since you can input numbers in either format, this means you can use Rhythm. I also discovered a neat undocumented feature. If you don't tell Rhythm to calculate by pressing [RETURN], you can also use the software like a memo pad to type little messages to yourself (such as "mortgage payments due") within the columns of the spreadsheet as long as they're not on the same line as the formula.

The program doesn't include statistical functions, but you can type them in on a row and the program will retain them. In fact, Rhythm saves the entire window whenever you exit the program. This can be a real time saver if you use the same calculations over and over again. But if you don't want to save them, it can be a real nuisance. Everytime you want to exit Rhythm, you must place a non write-protected disk in the active drive so that the program can save the current equations. It would be nice to be able to tell the program to abort the current session without saving to disk.

Another feature Rhythm lacks is the ability to load different windows, depending on the functions that you need. Since there are only ten cells, these windows would greatly expand the program's practicality. From the documentation it appears that Rhythm was originally intended to have a cut-and-paste feature that was never implemented. The program doesn't suffer excessively for not having these features; it just seems strange that they weren't included.

Another minor problem is in the expression handling. Rhythm evaluates all the operators in an expression from left to right. However, exponentials are supposed to be evaluated from right to left. The manual very clearly documents this "feature" and shows examples on how to rewrite your equation so that it will be evaluated properly.

With these exceptions, I am very pleased with the package. Using it has been so natural that the only reason I needed the 10-page manual was to learn the functions. Although the manual is brief, it is very well written, easily understood and quite sufficient. The only missing information is the maximum size of a single data element (16,777,215 without exponents) and the amount of memory that it uses (37K).

It is not surprising that one of the first commercial desk accessories on the market is a calculator. What is surprising is that SofTechnics didn't settle for just a calculator. Instead they created an innovative and useful package that is powerful yet easy to use. If you ever need a calculator at your fingertips, this package may be the one you want to own.

HACKER

Activision
P.O. Box 7286
Mountain View, CA 94039
(415) 960-0410
$44.95

Reviewed by David Plotkin

Hacker is one of the most original and addicting games I have experienced in quite a while. It combines elements of role-playing and problem-solving with thoroughly enjoyable results.

As in the 8-bit version, reviewed in

the February, 1986 **Antic**, Hacker simulates breaking into someone's mainframe computer. Once there, you find some rather dangerous corporate maneuvering. You are assigned a mission, and from there you must figure out how to best accomplish it. It's important not to tell you too much, as most of the fun in this game comes from determining what responses are necessary and how various mechanisms work in order to fulfill your mission. All answers to puzzles are logical, so the solutions are mainly a matter of perseverance.

Hacker for the ST is entirely mouse-driven. The graphics don't tax the ST to its limits, but they're quite good and easy to look at for long periods of time. This is important. If you get hooked, count on some marathon sessions. The strongest point of Hacker is the problem-solving aspect, the game is really a gigantic puzzle with only one right answer. The puzzle itself is quite original, I have never run across one like it before.

On the ST, Hacker plays very similarly to the 8-bit version. A word of warning, however. Those tricksters at Activision changed the puzzle for the ST conversion! You may notice that my review of the ST Hacker is considerably more enthusiastic than **Antic's** earlier 8-bit review. This is not too surprising, since people tend to either love or hate "puzzle" games with very little middle ground. If you like real mindbenders and fantasy role-playing, then I recommend Hacker for your ST entertainment.

HIPPOSPELL
Hippopotamus Software
985 University Avenue, Suite 12
Los Gatos, CA 95030
(408) 395-3190
$39.95

Reviewed by Sol Guber

The **HippoSpell** spelling checker is so easy to use that all you need to know is how to move the mouse to the drop-down menus. A few minutes of reading the 12-page manual clearly explains all about the software.

A good spelling checker is **unobtrusive**, (this word is in the dictionary), fast, and simple to use. HippoSpell meets all of these **criteria** (also in the dictionary). The program works with ST software that generates standard ASCII text files. This means it's compatible with the STwriter and Express word processors, but not 1st-Word.

Click "Check the File" on the HippoSpell main menu, and you'll see a disk directory of your word processing files. Make your selection and quickly (about 2K per second) the words that you wrote are analyzed. Any length file can be used since only about 20K is brought into memory at one time.

When a word is not in the 30,000-word dictionary, a box comes on the screen asking if it is correct. Press [RETURN] to signal correct, or click the NO box to signal incorrect. The program then tries to find 10 words that might be correct. Each function key can select one of the possible correct choices, or you can type in the word yourself. Very quick and very easy! The software is almost clever, too. It can recognize "thqt" as "that" and present it as the only choice.

With HippoSpell, you can read your file after the changes have been made. You can save as many as 10,000 new words to a dictionary to be automatically checked next time.

HippoSpell will also tell you how many times you used each word in your file, analyze the length of your words, and even show you how many words you used.

I have only one **quibble** (yes, it's in the dictionary) with the program. It does not show misspelled words in context. However, giving you a list of choices to correct your misspelled words seems to more than make up for this. HippoSpell is solid, workable, does what it is designed to do, and does it very fast.

by GIGI BISSON, **Antic** Assistant Editor

New Products

THE IBM-ST

Real IBM PC compatibility will finally become a reality for the Atari ST. At computer shows in Paris, London and West Germany, Atari Corp. unveiled a product prototype code-named the "MS-DOS Box."

Designed by Atari engineer Jim Tittsler, the MS-DOS emulator is essentially an 8088 microprocessor board encased in metal like a hard-disk drive and plugged into the DMA (Direct Memory Access) port. It comes with 512K memory, an 8088 microprocessor and a socket for the 8087 math co-processor. Atari hopes to keep the price under $300.

Atari claims the MS-DOS emulator will enable the ST to be compatible with 90% of IBM PC software at speeds greater than the IBM PC. However, Tittsler says the box won't be able to run graphic-based software such as Lotus 1-2-3 until the final BIOS routines are written.

THE CP/M ST?

CP/M, one of the earliest microcomputer operating systems, is used by the Osborne, Kaypro and other computers. Availability of CP/M for the ST will open up enormous libraries of existing software. At this writing, Atari Corp.'s $49.95 **CP/M Operating System emulator** is already in use in West Germany. Licensing agreements are different in Germany, where computer magazines are advertising Micro Pro **Wordstar 3.0** "fur den Atari ST" in 3.5-inch ST disk format. The German magazine *ST Computer* featured a review of Borland International's **Turbo Pascal** running on the ST with CP/M emulation. According to John Scruch at Atari, the emulator should be shipped in the U.S. by the time you read this.

Atari Corp., 1196 Borregas Avenue, Sunnyvale, CA 94086. (408) 745-2367. BETA.

No hype. It's the largest computer and electronics trade show in the world. CeBIT, known to the industry as the Hanover Faire, is even grander than the mighty COMDEX. The annual show in Hanover, West Germany boasted 2,100 ex-

continued on next page

hibitors spread throughout 205,000 meters of display area in 13 buildings. Atari Germany spared no expense at the lavish booth tempting dealers and retailers with rich food, German beer and fine chocolates. Once again, the booth was open to nearly 50 third-party software developers.

At the Atari Computer Show sponsored by AtariUser magazine in London, Jeff Minter, the long-haired 23-year-old president of Llamasoft, created stroboscopic fireworks and pulsating colors on his new **ST Colourspace** light synthesizer. Not suprisingly, in the Colourspace manual Minter cites as his influences, "Rock groups Rush, Genesis and Pink Floyd." The $29.95 program is now being distributed to U.S. dealers.

Apex Resources, 17 St. Mary's Court, Brookline, Mass. (617) 232-9686. FINAL.

European universities are adopting the ST as the machine of choice. **Fortran** 77, long a standard in universities, is finished from two companies—**Philon** in New York and Prospero in the U.K. With GEM bindings included, **Prospero Pro Fortran** retails for $149.95. **Philon's Fast/Fortran is $299.** Fortran in one standard or another has been around since the late '50s, so the ST can take advantage of existing quantities of Fortran-compatible public domain engineering and educational software.

Prospero Software, 190 Castelnau, London SW13 9DH, England. 01-741-8531. FINAL.

Philon, Inc., 641 Avenue of the Americas, New York, NY 10011. (212) 807-0303. FINAL.

THE MAC ST

After Europe, the West Coast Computer Faire in San Francisco looked like a swap meet in comparison. Crowds were ample, new product displays were slim.

The most controversial product at the Faire was Data Pacific's **Mac Cartridge**. Invented by **Antic** Contributing Editor David Small, Mac Cartridge allows a one-megabyte ST to run software written for Apple Computer's Macintosh.

It's an eerie sight watching MacPaint appear on the larger 1040ST screen as Small zips through window after window, at speeds 20% faster than the Mac. He has the cartridge up and running—with one minor hitch. It requires the Apple Macintosh ROM chip.

Though Data Pacific president Joel Rosenblum says he purchased the chips off the shelf from an Apple dealer, his small company is destined to have trouble getting permission from Apple to license the ROM chips. Apple has already turned down ROM chip requests from corporate giants General Electric and AT&T. Data-Pacific could conceivably have users install the ROMS in cartridge themselves. As Mac users upgrade to 512K and 1Mb ROMs, the old chips could be put to use in the ST Mac Cartridges.

Data Pacific, Inc., P.O. Box 10805, Marina del Rey, CA 90295. DEMO.

Andromeda Software, a development company with offices in London and the U.S., demonstrated a prototype of **Animate!**, a graphic animation system developed by a team of Hungarian programmers. Even more impressive was **ST/ART**, a picture processor for the ST that bends computer graphic images into spheres, crushes them into cubes, and twists them into shapes resembling funhouse mirrors while every pixel remains in scale. Then, utilizing the Animate! program, it sends the shapes ricocheting across the screen like Amiga bouncing balls. Andromeda has also developed an ST home version of the classic Atari arcade game Millipede and a full-color Battle Zone for the ST.

Andromeda Software, 4966 El Camino Real, Suite 201, Los Altos, CA 94022. DEMO.

The show also marked the first appearance of **Micro RTX** ($69.95), an Atari ST multitasking operating system. The developer claims Micro RTX can run standard ST programs out of the box, be used as a printer spooler, or allow a user to run a bulletin board and use the computer for a separate task at the same time. Inventor David Beckemeyer is hoping for a summer release date.

Beckemeyer Development Tools, 592 Jean Street #304, Oakland CA 94610. DEMO,

The first ST release from Electronic Arts is in our hands. It's **Financial Cookbook**, an ST conversion of the 8-bit home financial management software program that offers financial decision-making advice on such topics as mortgages, interest rates and buying a car.

Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. (415) 571-7171. FINAL.

Interlink ($39.95), a terminal communications package, uses the GEM interface while allowing online communications to appear on a full 25 line by 80 column screen. Features autodial, XMODEM and programmable function keys. The **Orchestrator** ($49.95) is a music composition and entertainment system that utilizes GEM and the ST's internal sound chip.

Intersect Software Corp., P.O. Box 49346, Sarasota, FL 33578. (813) 953-8865. BETA.

Here's the latest from HippoNews, the new newsletter from those prolific folks at Hippopotamus Software. **HippoWord** ($89.95), is the first ST word processor compatible with laser printers. It features true multi-column editing, fonts, word statistics, and 80-column editing and can combine picture files from NEOChrome or Degas with text. **HippoLaser** ($69.95) contains the laser driver and fonts. BETA.

Hippo has two other ST releases already on the market. **HippoPixel** ($39.95) allows you to create and edit your own custom fonts or sprites. **HippoConcept** ($89.95) is an idea processor like Lotus Think-Tank. **Hippo X-10 Powerhouse** ($139.95), a home controller that dims lights and appliances, and the **Hippo WAO Educational Robot** ($149.95) are in BETA stage at this writing and are slated for a summer release.

Hippopotamus Software, Inc., 985 University Avenue, Suite 12, Los Gatos, CA 95030.

68000, 6810, 6820 Primer ($21.95), a 368-page manual by Stan Kelly-Bootle and Bob Fowler, introduces novices and experienced programmers to the 68000 microprocessor instruction set and addressing modes, chip architecture, and how to program in Assembly language.

Howard Sams & Co., 4300 W. 62 Street, Indianapolis, IN 46268. (317) 298-5400. PRESS.

*New ST product notices are compiled from information provided by the products' manufacturers. **Antic** assumes no responsibility for the accuracy of these notices or the performance of the product. Each mention is followed by a code word indicating that, at press time, **Antic** had seen a FINAL marketable version, near-final BETA, earlier ALPHA, incomplete DEMO, or PRESS release.*

SOFTWARE LIBRARY

Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

DISK SUBSCRIBERS: Programs for 8-bit Atari computers can be used immediately. Just follow instructions in the accompanying magazine articles. ST Owners: See monthly disk's ST Help File for instructions on how to transfer programs to 3-1/2 inch disk.

Antic program listings are typeset on the Star's SB-10 printer—from Star Micronics, Inc., 200 Park Avenue, New York, NY 10166.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
♥	CTRL ,	●	CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H	↑	ESC CTRL –
	CTRL I	↓	ESC CTRL =
	CTRL J	←	ESC CTRL +
	CTRL K	→	ESC CTRL *
	CTRL L	◆	CTRL .
	CTRL M	♠	CTRL ;
	CTRL N		SHIFT =
	CTRL O		ESC SHIFT CLEAR
♣	CTRL P	◀	ESC DELETE
	CTRL Q	▶	ESC TAB
	CTRL R		
	CTRL S		

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	Λ CTRL ,		Λ CTRL Y
	Λ CTRL A		Λ CTRL Z
	Λ CTRL B		ESC SHIFT DELETE
	Λ CTRL C		ESC SHIFT INSERT
	Λ CTRL D		ESC CTRL TAB
	Λ CTRL E		ESC SHIFT TAB
	Λ CTRL F		Λ CTRL .
	Λ CTRL G		Λ CTRL ;
	Λ CTRL H		Λ SHIFT =
	Λ CTRL I		ESC CTRL 2
	Λ CTRL J		ESC CTRL DELETE
	Λ CTRL K		ESC CTRL INSERT
	Λ CTRL L		
	Λ CTRL M		
	Λ CTRL N		
	Λ CTRL O		
	Λ CTRL P		
	Λ CTRL Q		
	Λ CTRL R		
	Λ CTRL S		
	Λ CTRL T		
	Λ CTRL U		
	Λ CTRL V		
	Λ CTRL W		
	Λ CTRL X		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, ***bold it down*** while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key ◢ . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key Λ instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL			STANDARD		
		CTRL F	/		/
		CTRL G	\		SHIFT +
		CTRL N	—		SHIFT -
		CTRL R	-		–
		CTRL S	+		+

HOW TO USE TYPO II

TYPO II is the improved automatic proofreading program for **Antic's** type-in BASIC listings. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at left of the line number. Press [RETURN].

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II "

EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
```

Don't type the TYPO II Codes!

```
ET 32120 ? "K":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VU 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

TECH TIPS

DELETING BASIC

Here's a quick way to get out of BASIC if you have booted your XL/XE computer without pressing the [OPTION] key:

POKE 1016,1 [RETURN] [RESET]

This will take you to the DOS menu and out of BASIC. Make sure you have a disk in drive 1 with DOS.SYS and DUP.SYS when you do this, unless you are using a resident DOS such as DOS XL.

USING [HELP] KEY

You can use the [HELP] key very easily from within any program by simply doing a PEEK(732). Here are the values you may expect to receive:

0 [HELP] not pressed.
17 [HELP] pressed.
81 [SHIFT] [HELP] pressed
145 [CONTROL] [HELP] pressed

Do a POKE 732,0 after you have PEEKed, before you PEEK it a second time.

DISK DIRECTORY FROM BASIC

This short routine could be inserted in your own program to print a disk directory. Line 100 breaks the loop without relying on the end-of-file error, as do many similar routines.

Don't type the TYPO II Codes!

```
ZQ 10 REM DISK DIRECTORY FROM BASIC
GK 20 MAXFILES=64
MX 30 DIM A$(30),D$(6)
GN 40 D$="D1:*.*"
LT 50 GRAPHICS 0
BW 60 CLOSE #2:TRAP 120
LI 70 OPEN #2,6,0,D$
MS 80 FOR I=1 TO MAXFILES
MX 90 INPUT #2,A$
UL 100 IF A$(5,10)="FREE S" THEN I=MAXFIL
   ES
GZ 110 PRINT A$:NEXT I
LN 120 CLOSE #2
NW 130 END
```

AMAZING CARD SHUFFLER

Article on page 24

LISTING 1

Don't type the TYPO II Codes!

```
GA 1 REM COMPDECK.BAS
EU 2 REM BY CHET WALTERS
FR 3 REM (c) 1986, ANTIC PUBLISHING
MM 10 GOSUB 20000:DIM CRD$(1921),SHOW$(40
   ),A$(20),B$(20),F0$(20),C1(5):F0$="  D
   ECK FILE":GOSUB 500:GOSUB 510
ZV 20 SHOW$="hhhhhhh[illegible]":B$=F0$(3):DNUM=1:? :GOSUB 5
   20:F0$="D:":F0$(3)=A$
BL 30 F0$(LEN(F0$)+1)=".DCK":B$="INPUT PI
   C":GOSUB 580:? :? "DECK FILE IS->";F0$
   ;" ";:GOSUB 800
QR 35 IF K$="N" THEN RUN
YH 40 GOSUB 500:GOSUB 510:? :? "ENTER DRI
   VE #(1 OR 2) FOR PICDISK->";:INPUT DNU
   M
JW 45 IF DNUM<1 OR DNUM>2 THEN 40
PF 50 GOSUB 500:CARD=1:? "COLORS LOADED W
   ITH THIS FILE WILL":? "BE USED THROUGH
   OUT COMPILATION":GOTO 70
BP 60 ? "SAVE COMPLETE":? "USE ";FI$(4,LE
   N(FI$)-2);" AGAIN FOR CARD #";CARD;
VM 65 GOSUB 800:IF K$<>"N" THEN 90
LI 70 ? :? "INSERT PICDISK INTO DRIVE # "
   ;DNUM:? :GOSUB 520
VO 72 IF A$="/EXIT" THEN CLOSE #1:CLOSE #
   2:GRAPHICS 0:? "ABORTED AT YOUR REQUE
   ST!":END
SY 75 FI$="D1:":FI$(2,2)=STR$(DNUM):FI$(4
   )=A$:GOSUB 580
XQ 80 FI$(LEN(FI$)+1)=".*":? :? "LOADING-
   > ";FI$;:LN=70:GOSUB 21000
TN 85 IF CARD=1 THEN FOR I=0 TO 4:C1(I)=C
   (I):NEXT I
XS 90 FOR I=0 TO 4:C(I)=C1(I):NEXT I:GOSU
   B 22000:GOSUB 501:POKE 559,0:GOSUB 230
   00:POKE 195,0
GE 100 I=USR(ADR("[illegible]")):POKE 559,34:ADDR=SCR:MV=0:I=US
   R(ADR(SHOW$),ADDR)
XY 110 MV=0:GOSUB 620:IF K=15 OR K=143 TH
   EN MV=40+280*(K=143):GOTO 180
UV 120 IF K=14 OR K=142 THEN MV=-40-280*(
   K=142):GOTO 180
XM 130 IF K=7 OR K=135 THEN MV=1+(K=135):
   GOTO 180
IT 140 IF K=6 OR K=134 THEN MV=-1-(K=134)
   :GOTO 180
II 150 IF K=12 THEN 200
XF 160 IF K=28 THEN GOSUB 500:GOTO 70
MF 170 GOTO 110
OJ 180 IF  NOT (ADDR+MV>SCR+3860 OR ADDR+
   MV<SCR) THEN 190
KY 185 POKE 18,0:POKE 19,0:POKE 20,0:POKE
    712,12:POKE 712,C1(4):GOTO 110
FQ 190 I=USR(ADR(SHOW$),ADDR):ADDR=ADDR+M
   V:I=USR(ADR(SHOW$),ADDR):GOTO 110
FJ 200 I=USR(ADR("[illegible]"),ADDR
   ,ADR(CRD$))
GL 210 GOSUB 500:LN=220:GOSUB 590:?
VE 220 IF DNUM=1 OR PEEK(195)<>0 THEN ? :
   ? "INSERT DISK FOR ";F0$(3):? "INTO DR
   IVE 1":GOSUB 600:?
PH 230 ? "SAVING CARD #";CARD;" IN ";F0$(
   3);
VG 240 POKE 195,0:IF CARD=1 THEN CLOSE #2
   :OPEN #2,8,0,F0$:FOR I=0 TO 4:PUT #2,C
   1(I):NEXT I
KD 250 I=USR(ADR(CIO$),32,11,ADR(CRD$),19
   20):CARD=CARD+1:IF CARD<>13 THEN ? "[illegible]"
   ;:GOTO 60
EO 260 CLOSE #2:GOSUB 500
XZ 270 LN=270:? :? F0$(3,LEN(F0$)-4);" DE
   CK COMPLETED!":? :? "DO YOU WANT TO:"
WL 280 ? "1-> COMPILE ANOTHER DECK":? "2-
   > SHUFFLE ";F0$(3):? "3-> QUIT TO BASI
   C":? "4-> GO TO DOS"
MQ 290 TRAP 270:INPUT A:GRAPHICS 0:ON A G
   OTO 310,320,330,340
DN 300 GOSUB 500:GOTO LN
UP 310 RUN
MX 320 ? :? "INSERT DISK WITH DECKLOAD.BA
   S ":GOSUB 600:? :? "LOADING":RUN "D:DE
   CKLOAD.BAS"
KO 330 GRAPHICS 0:END
SC 340 DOS
AR 500 GRAPHICS 0:? "}  ANTIC'S DECK COM
   PILER ":? :TRAP 630
DH 501 POKE 16,64:POKE 53774,64:RETURN
HY 510 ? F0$(3);" REQUIRES 185 FREE SECT.
   ":? "AND IS WRITTEN TO DRIVE#1":GOTO 5
   90
XN 520 ? "ENTER NAMES WITH NO PREFIX OR E
   XT.":? "PRESS RETURN FOR DIRECTORY":LN
   =520
MY 525 IF CARD>0 THEN ? "TYPE:   /EXIT   T
   O ABORT"
UR 530 IF CARD THEN ? :? "WORKING ON CARD
    #";CARD;" FOR ";F0$(3):?
BT 540 ? B$;" FILENAME->";:INPUT A$:IF A$
   <>"" THEN RETURN
EK 550 GOSUB 500:CLOSE #1:A$="D1:*.*":A$(
   2,2)=STR$(DNUM):OPEN #1,6,0,A$
QM 560 INPUT #1,A$:IF A$(2,2)<>" " THEN ?
   :? ,A$:? :CLOSE #1:GOTO 520
ZQ 570 POKE 83,37:? A$(2,10);:POKE 83,39:
   GOTO 560
SV 580 ? :? "DURING EDIT USE:":? "ARROW K
   EYS OR JOYSTICK TO MOVE WINDOW"
TM 581 ? "CTRL/ARROWS OR JOYSTICK TO MOVE
   FAST"
NS 582 ? "RETURN OR TRIGGER TO SAVE WINDO
   W":? "ESC TO LOAD NEW PIC":RETURN
OP 590 ? "OUTPUT FILE REMAINS OPEN!":? "
   DON'T CONFUSE DISKS! ":RETURN
ST 600 ? " PRESS ANY KEY";:GOTO 700
OR 610 ? "(Y/N)Y←";
WQ 620 POKE 764,255
OR 621 IF (PEEK(764)=255 AND PEEK(632)=15
   AND PEEK(644)=1) THEN POKE 19,0:POKE
   18,0:POKE 20,128:K=0:GOTO 621
JJ 622 TIM=PEEK(19)+PEEK(18)*256:IF PEEK(
   644)=0 THEN K=12:GOTO 629
HC 623 K=(15*(PEEK(632)=13)):IF K<>0 THEN
   628:REM DOWN
GS 624 K=(14*(PEEK(632)=14)):IF K<>0 THEN
   628:REM UP
DJ 625 K=(7*(PEEK(632)=7)):IF K<>0 THEN 6
   28:REM RIGHT
YS 626 K=(6*(PEEK(632)=11)):IF K<>0 THEN
   628:REM LEFT
RD 627 IF K=0 THEN K=PEEK(764):GOTO 629
MD 628 K=K+(K<>0)*(128*(TIM>0))
YL 629 POKE 764,255:RETURN
HE 630 GOSUB 500:? "**ERROR->";PEEK(195):
   GOTO LN
WN 700 POKE 764,255
EY 710 IF PEEK(764)=255 THEN 710
XL 720 POKE 764,255:RETURN
IJ 800 ? "(Y/N) Y←";:INPUT K$:RETURN
VP 19999 REM MICROSCREEN LOADER
UJ 20000 DIM C(5),FI$(20),CIO$(30),MV$(64
   ),BF$(7680),K$(1)
LC 20009 REM INITIALIZE VARIABLES
IL 20010 RESTORE 20030:FOR I=1 TO 3:READ
```

```
   MV$:BF$(LEN(BF$)+1)=MV$:NEXT I:CIO$="h
   hh[illegible]LVd"
XS 20020 MV$="[illegible]":I=USR(A
   DR(MV$),ADR(BF$),1536,250):RETURN
LQ 20030 DATA [illegible]
QW 20040 DATA [illegible]
OJ 20050 DATA [illegible]
FC 20998 REM
RT 20999 REM LOAD PIC INTO BUFFER STRING
ML 21000 CLOSE #1:BYTES=7680:TYPE=0:RESTO
   RE 21000:OPEN #1,4,0,FI$:DATA 255,128,
   201,199,26,0,1,14
GK 21010 FOR I=1 TO 7:GET #1,A:POKE ADR(B
   F$)+I-1,A:READ H:IF A<>H THEN POP :GOT
   O 21040
AN 21020 NEXT I:GET #1,TYPE:FOR I=1 TO 5:
   GET #1,A:NEXT I:FOR I=0 TO 5:GET #1,A:
   C(I)=A:NEXT I:GET #1,H
FI 21030 FOR I=1 TO 7:GET #1,A:NEXT I:I=0
   :IF TYPE THEN BYTES=H*256+255
BK 21040 A=USR(ADR(CIO$),16,7,ADR(BF$)+I,
   BYTES-I):IF I=0 THEN 21060
QV 21050 C(3)=0:C(4)=0:C(0)=135:C(1)=53:C
   (2)=15:TRAP 21060
AW 21055 GET #1,A:C(4)=A:FOR I=0 TO 2:GET
    #1,A:C(I)=A:NEXT I
KI 21060 TRAP 630:CLOSE #1:RETURN
FE 21998 REM
VO 21999 REM SET UP DISPLAY LIST
IN 22000 IF PEEK(87)=8 THEN 22020
TA 22010 GRAPHICS 24:I=USR(ADR("[illegible]"))
DN 22020 SCR=PEEK(88)+256*PEEK(89):RETURN
FG 22998 REM
CA 22999 REM DUMP PICTURE TO SCREEN
JL 23000 FOR I=0 TO 4:POKE 708+I,C(I):NEX
   T I
GO 23010 IF TYPE THEN I=USR(1536,SCR,TYPE
   -1,ADR(BF$)):RETURN
GC 23020 I=USR(ADR(MV$),ADR(BF$),SCR,7680
   ):RETURN
```

LISTING 2

```
YY 10 REM COMPDECK HELPER
IJ 20 REM BY CHET WALTERS
GL 30 REM (c) 1986, ANTIC PUBLISHING
NY 32 REM (CREATES LINES 20, 100 AND 200
   FOR COMPDECK.BAS.)
CQ 40 REM (LINES 10-220 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
HO 60 DPL=PEEK(10592):POKE 10592,255
NW 70 FN$="D:LINES2.LST":REM THIS IS THE
   NAME OF THE DISK FILE TO BE CREATED
UA 75 REM (REMEMBER, YOU NEED BOTH LINES1
   .LST AND LINES2.LST!)
YS 80 GRAPHICS 0:? "     ANTIC'S GENERIC
   BASIC LOADER"
CD 90 ? ,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")     "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "[illegible]TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CZ 180 IF C<LN+1 THEN ? :? "[illegible]TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "COMPLETED
   "
IA 1000 DATA 281
FC 1010 DATA 050048032083072079087036061O
   341041041332051041332041620951600191 77
   204073255145204136016247165
PV 1020 DATA 204024105040133204165205105O
   001332052020162290960340580660360610 70
   079036040051041058068078085
SU 1030 DATA 077061049058063032058071079O
   830850660320530500480580700790360610 34
   068058034058070079036040051
RG 1040 DATA 041061065036155049048048032O
   730610850830820400650680820400341041 68
   165088133204165089133205162
SZ 1050 DATA 030177204073255145204136208 2
   472320520220824209603404104105808007 9
   075069032053053057044051052
NC 1060 DATA 058065068068082061083067082O
   580770860610480580730610850830820400 65
   068082040083072079087036041
PN 1070 DATA 044065068068082041155050048O
   480320730610850830820400650680820400 34
   104104133206104133205104133
EX 1080 DATA 204104133203162096160019177 2
   051452031360162491652050241050401332 05
   165206105000133206165203024
MJ 1090 DATA 105020133203165204105000133 2
   042022082180960340410440650680680820 44
   065068082040067082068036041
QZ 1100 DATA 041155
```

LISTING 3

```
BB 1 REM DECKLOAD.BAS
EU 2 REM BY CHET WALTERS
FR 3 REM (c) 1986, ANTIC PUBLISHING
GU 10 POKE 0,77:GOSUB 200:GOSUB 20000:DIM
    A$(100),B$(250)
LB 20 FI$="D:TITLE.PIC":TRAP 30:? :? ,"LO
   ADING ";FI$(3):GOSUB 21000:TITLE=1
CS 30 GOSUB 200:? :? "DURING SHUFFLE, PRE
   SS:":? :? "ANY KEY TO PAUSE DISPLAY":?
    "OPTION  FOR MAX DELAY ON/OFF"
UY 40 ? "SELECT  FOR VARIABLE DELAY ON/OF
   F":? "START   TO RETURN HERE":IF TITLE
   =0 THEN ? ,"TITLE.PIC NOT PRESENT"
RW 50 DRIVE=1:DECK=0:FI$="DECK FILES:":?
   :? FI$:? :N$="D?:*.*"
UH 55 TRAP 80:CLOSE #1:N$(2,2)=STR$(DRIVE
   ):OPEN #1,6,0,N$
VW 60 INPUT #1,A$:IF A$(11,13)="DCK" THEN
    POKE 83,37:? " ";A$(2,9);:POKE 83,39:
   DECK=1
TH 70 GOTO 60
BZ 80 TRAP 85:CLOSE #1:IF DECK=0 THEN DRI
   VE=DRIVE+1:GOTO 55
KN 85 CLOSE #1:IF DECK=0 THEN ? :? FI$;"
   NOT ON THIS DISK":? "INSERT PROPER DIS
   K-HIT RETURN":INPUT A$:GOTO 30
OX 90 ? :? :? "PRESS RETURN FOR ANOTHER D
   ISK OR":? "ENTER CHOICE OF DECK AS":?
   "IT APPEARS ABOVE-";:INPUT A$
BJ 95 IF LEN(A$)<1 THEN 50
PU 100 TRAP 85:FI$(1,3)=N$(1,3):FI$(4)=A$
   :FI$(LEN(FI$)+1)=".DCK":DECK=0:OPEN #1
   ,4,0,FI$:CLOSE #1:GOSUB 22000
ZG 110 POKE 559,0:IF TITLE THEN GOSUB 230
   00
BB 120 POKE 559,34:RESTORE 150:B$="":FOR
   I=1 TO 2:READ A$:B$(LEN(B$)+1)=A$:NEXT
    I
QO 130 B$(LEN(B$)+1)=CIO$:B$(LEN(B$)+1)=F
   I$:FI$="D:SHUFFLE.BAS":OPEN #1,4,0,FI$
   :CLOSE #1
LY 140 I=USR(ADR(MV$),ADR(B$),1536,250):R
   UN FI$
DS 150 DATA [illegible]
IO 160 DATA [illegible]
ZU 200 GRAPHICS 0:POKE 710,50:POKE 712,50
   :? "    ANTIC'S AMAZING CARD SHUFFLER
   ":? :? :RETURN
```

continued on next page

```
VP 19999 REM MICROSCREEN LOADER
ZJ 20000 DIM C(5),FI$(20),CIO$(30),MV$(64
   ),BF$(7680),N$(10)
LC 20009 REM INITIALIZE VARIABLES
IL 20010 RESTORE 20030:FOR I=1 TO 3:READ
   MV$:BF$(LEN(BF$)+1)=MV$:NEXT I:CIO$="h
   hh[illegible]hh[illegible]B[illegible]h[illegible]E[illegible]h[illegible]D[illegible]h[illegible]I[illegible]h[illegible]H[illegible]LV[illegible]"
XS 20020 MV$="hh[illegible]":I=USR(A
   DR(MV$),ADR(BF$),1536,250):RETURN
LQ 20030 DATA [illegible]
QW 20040 DATA [illegible]
OJ 20050 DATA [illegible]
FC 20998 REM
RT 20999 REM LOAD PIC INTO BUFFER STRING
ML 21000 CLOSE #1:BYTES=7680:TYPE=0:RESTO
   RE 21000:OPEN #1,4,0,FI$:DATA 255,128,
   201,199,26,0,1,14
GK 21010 FOR I=1 TO 7:GET #1,A:POKE ADR(B
   F$)+I-1,A:READ H:IF A<>H THEN POP :GOT
   O 21040
AN 21020 NEXT I:GET #1,TYPE:FOR I=1 TO 5:
   GET #1,A:NEXT I:FOR I=0 TO 5:GET #1,A:
   C(I)=A:NEXT I:GET #1,H
FI 21030 FOR I=1 TO 7:GET #1,A:NEXT I:I=0
   :IF TYPE THEN BYTES=H*256+255
BK 21040 A=USR(ADR(CIO$),16,7,ADR(BF$)+I,
   BYTES-I):IF I=0 THEN 21060
OF 21050 C(3)=0:GET #1,A:C(4)=A:FOR I=0 T
   O 2:GET #1,A:C(I)=A:NEXT I
CC 21060 CLOSE #1:RETURN
FE 21998 REM
VO 21999 REM SET UP DISPLAY LIST
IN 22000 IF PEEK(87)=8 THEN 22020
TA 22010 GRAPHICS 24:I=USR(ADR("h[illegible]"))
PX 22020 SCR=PEEK(88)+256*PEEK(89):RETURN
    :REM SCREEN IS HERE
FG 22998 REM
CA 22999 REM DUMP PICTURE TO SCREEN
JL 23000 FOR I=0 TO 4:POKE 708+I,C(I):NEX
   T I
GO 23010 IF TYPE THEN I=USR(1536,SCR,TYPE
   -1,ADR(BF$)):RETURN
GC 23020 I=USR(ADR(MV$),ADR(BF$),SCR,7680
   ):RETURN
```

LISTING 4

```
TK 10 REM DECKLOAD HELPER
IJ 20 REM BY CHET WALTERS
GL 30 REM (c) 1986, ANTIC PUBLISHING
MP 32 REM (CREATES LINES 150-160 FOR DECK
   LOAD.BAS.)
CQ 40 REM (LINES 10-220 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
HO 60 DPL=PEEK(10592):POKE 10592,255
OM 70 FN$="D:LINES3.LST":REM THIS IS THE
   NAME OF THE DISK FILE TO BE CREATED
WB 75 REM (REMEMBER, YOU NEED BOTH LINES1
   .LST AND LINES3.LST!)
YS 80 GRAPHICS 0:? "      ANTIC'S GENERIC
   BASIC LOADER"
CD 90 ? ,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "[illegible]TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CZ 180 IF C<LN+1 THEN ? :? "[illegible]TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "COMPLETED
   "
GH 1000 DATA 133
QW 1010 DATA 0490530480320680650840650321
   04133077104133207104133206104208002169
   001133209104133208162096160
XW 1020 DATA 0191772031452061360162491652
   06024105040133206165207105000133207165
   203024105020133203165204105
TS 1030 DATA 0001332042022082181982052080
   12165140155049054048032068065084065032
   133203165141133204169012133
KE 1040 DATA 2051732520022012552080101982
   08208245198209208241240017169255141252
   002173252002201255240249169
PH 1050 DATA 255141252002096234234234155
```

LISTING 5

```
FS 10 REM COMPDECK & DECKLOAD HELPER
IJ 20 REM BY CHET WALTERS
GL 30 REM (c) 1986, ANTIC PUBLISHING
XF 32 REM (CREATES LINES 20010-20050 AND
   22010 FOR COMPDECK.BAS AND DECKLOAD.BA
   S)
CQ 40 REM (LINES 10-220 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
HO 60 DPL=PEEK(10592):POKE 10592,255
NG 70 FN$="D:LINES1.LST":REM THIS IS THE
   NAME OF THE DISK FILE TO BE CREATED
IP 75 REM (OUTPUT FILE CAN BE USED WITH B
   OTH DECKLOAD.BAS AND COMPDECK.BAS)
YS 80 GRAPHICS 0:? "      ANTIC'S GENERIC
   BASIC LOADER"
CD 90 ? ,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")      "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "[illegible]TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CZ 180 IF C<LN+1 THEN ? :? "[illegible]TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "COMPLETED
   "
HB 1000 DATA 513
QD 1010 DATA 0500480480490480320820690830
   84079082069032050048048051048058070079
   082032073061049032084079032
NS 1020 DATA 0510580820690650680320770860
   36058066070036040076069078040066070036
   041043049041061077086036058
EN 1030 DATA 0780690880840320730580670730
   79036061034104104104170104104157066003
   104157069003104157068003104
QP 1040 DATA 1570730031041570720030760862
   28034155050048048050048032077086036061
   034104104133204104133203104
OG 1050 DATA 1332061041332051041332081041
   33207160000166208240014177203145205136
   208249230204230206202208242
RX 1060 DATA 1642072400121361772031452051
   36208249177203145205096034058073061085
   083082040065068082040077086
XI 1070 DATA 0360410440650680820400660700
   36041044049053051054044050053048041058
   082069084085082078032155050
```

```
DD 1080 DATA 048048051048032068065084065032216104104133206104133205104133215133213133207104133214208002169
EZ 1090 DATA 080133212104133218104133217169030133208032178006169001133211032165006201128176004162000134211
LU 1100 DATA 0411272400081332091690001332101550500048048052048032068065084065032240017032165006133210032165
OS 1110 DATA 006133209076081006165211240003032165006164213165216145203198207208005198208208001096165214208
IM 1120 DATA 0382302151662152240962080090321780061600401322132080342241922080171550500048048053048032068065
MS 1130 DATA 084065032230205208002230206032178006162000134215134213240013024165203101212133203165204105000
YU 1140 DATA 133204198209208175198210016171076037006160000177217133216230217208002230218096165205133203165
ZX 1150 DATA 206133204096155050050048049048032071082065080072073067083032050052058073061085083082040065068
SL 1160 DATA 082040034104168173048002133203173049002133204200177203201065208001096056233001201078208006145
KL 1170 DATA 203200200208235201014208231145203240227034041041155
```

LISTING 6

```
NU 1 REM SHUFFLE.BAS
EU 2 REM BY CHET WALTERS
FR 3 REM (c) 1986, ANTIC PUBLISHING
CU 8 IF PEEK(0)<>77 THEN RUN "D:DECKLOAD.
   BAS"
LO 10 READ N,T,F,SN,TN,TW,CRD,TT:GOSUB SN
   *F:GOTO TT:DATA 1,2,4,7,10,20,1920,100
   00
JA 20 ADDR=ADDR+MV:J=USR(1536,ADDR,ABS(D1
   )*D3):D1=D1-D2:IF D1<-TT THEN D1=TT
CO 22 J=PEEK(53279):IF J=SN THEN RETURN
DC 24 IF J=F+T THEN POP :TRAP TW+TN:RUN "
   D:DECKL*.B*"
OA 26 IF J=N+T THEN D1=TT:D2=TW*TN*(D2=0)
   :D3=N:RETURN
TV 28 D2=TW*TN:D3=(D3=0):RETURN
BB 30 ADDR=SCR+TN:RESTORE TN*TW
EE 40 READ MV:IF MV<>-N THEN GOSUB TW:GOT
   O TW*T
HY 50 MV=0:ADDR=SCR+CRD+TN:FOR I=N TO SN*
   SN:GOSUB TW:NEXT I
DC 60 FOR I=0 TO TW*F:ADDR=SCR+RND(J)*382
   0:GOSUB TW:NEXT I
BK 70 ADDR=SCR:MV=180:FOR I=N TO TW:GOSUB
    TW:NEXT I
KS 80 MV=-156:ADDR=SCR+3996:FOR I=N TO TW
   +F:GOSUB TW:NEXT I:ADDR=SCR+TW:MV=0:GO
   SUB TW
WW 90 READ MV:IF MV<>-N THEN FOR I=N TO T
   +F:GOSUB TW:NEXT I:READ MV:GOSUB TW:GO
   TO 90
SX 100 GOTO TW+TN
MO 200 DATA 643,643,643,637,637,637,-643,
   -643,-643,-637,-637,-637,3,3,4,760,760
   ,760,760,800,-4,-4,-4,-4,-4,-760
LI 201 DATA -760,-760,-760,-800,643,643,6
   43,643,643,645,-4,-4,-4,-4,-4,-637,-63
   7,-637,-637,-637,-637,-4,-4,-4,-6
BN 202 DATA 0,20,3840,-20,-3840,3840,-384
   0,20,3820,-3840,3860,-3840,3820,-3820,
   -20,3860,-20,-3820,-20,3840,-3840,20
QK 204 DATA 3820,-3840,3860,-3840,3820,-3
   820,-20,3860,-20,-3820,-20,3840,-3840,
   20,3820,-3840,3860,-3840,3820,-3820
YI 205 DATA -20,3840,20,-3840,303,3200,14
   ,-3200,309,2560,8,-2560,316,1920,-1
YV 206 DATA 640,-3845,640,-3845,640,-3845
   ,640,-3845,640,0,-638,0,-1
IS 10000 J=INT(FRE(I)/CRD):DIM DCK$(J*CRD
   ):POKE 203,PEEK(140):POKE 204,PEEK(141
   ):IF J>TN+T THEN J=TN+T
AV 10010 POKE 205,J:POKE 1608,J:FOR I=0 T
   O TW:DCK$(I+N)=CHR$(PEEK(1677+I)):NEXT
    I:OPEN #N,F,0,DCK$
BU 10020 FOR I=0 TO F:GET #N,D1:POKE CRD-
   D2+I,D1:NEXT I:I=USR(1649,TW-F,SN,ADR(
   DCK$),J*CRD):CLOSE #N
RT 10030 SCR=PEEK(88)+256*PEEK(89):ADDR=S
   CR:RESTORE D2+T:FOR I=0 TO F:POKE 708+
   I,PEEK(CRD-D2+I):NEXT I:GOTO TW*T
```

LISTING 7

```
YD 1 REM QUARTER.BAS
EU 2 REM BY CHET WALTERS
FR 3 REM (c) 1986, ANTIC PUBLISHING
NU 5 GOSUB 100
VZ 10 GRAPHICS 8+16:COLOR 1:SCR=PEEK(88)+
   256*PEEK(89)
DM 20 PLOT 0,0:DRAWTO 319,0:DRAWTO 319,19
   1:DRAWTO 0,191:DRAWTO 0,0:PLOT 318,0:D
   RAWTO 318,191:PLOT 1,191:DRAWTO 1,0
LE 40 PLOT 158,191:DRAWTO 158,0:PLOT 159,
   0:DRAWTO 159,191:PLOT 160,191:DRAWTO 1
   60,0:PLOT 161,0:DRAWTO 161,191
HZ 50 PLOT 0,96:DRAWTO 319,96:PLOT 319,95
   :DRAWTO 0,95
YS 60 OPEN #1,8,0,"D:PICTURE":IO=848:POKE
    IO+2,11:POKE IO+4,PEEK(88):POKE IO+5,
   PEEK(89)
TT 65 POKE IO+8,0:POKE IO+9,30:I=USR(ADR(
   "hhh■LV■"),16)
UZ 70 PUT #1,PEEK(712):FOR I=0 TO 2:PUT #
   1,PEEK(708+I):NEXT I:CLOSE #1:END
DP 100 GRAPHICS 0:? "Press START to wri
   te a picture        template to your dis
   k."
RW 110 IF PEEK(53279)<>6 THEN 110
ZB 120 RETURN
```

ARTMAKER

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LISTING 1

Don't type the TYPO II Codes!

```
OU 10 REM ARTMAKER
NT 20 REM BY LEONARD BUCHANAN
GL 30 REM (c) 1986, ANTIC PUBLISHING
RF 35 GRAPHICS 0:? ,"   ARTMAKER":? :? "A
   VAILABLE SCREENS:":?
YZ 40 ? "(1) CITYSCAPE","(2) EYEFRAME"
QO 45 ? "(3) EYEOFGOD","(4) FRESCO"
JI 50 ? "(5) RNDCOLOR","(6) TEXTURES"
FQ 55 ? "(7) TVFRAME"
EC 56 POSITION 2,19:? "Choose a screen.":
   ? "Once it appears,":? "press [START]
   to SAVE it ";
PX 57 ? "(D:PICTURE)"
DB 58 ? "or [OPTION] to return to this me
   nu."
ZQ 60 TRAP 35:POSITION 2,10:? "YOUR CHOIC
   E";:INPUT CHOICE
FW 65 TRAP 40000
WQ 70 ON CHOICE GOSUB 100,200,300,400,500
   ,600,700
EK 75 FOR X=1 TO 100 STEP 2:SOUND 0,X,14,
   14:NEXT X:SOUND 0,0,0,0
VH 80 IF PEEK(53279)=3 THEN 35
YR 85 IF PEEK(53279)=6 THEN 90
UM 86 GOTO 80
NT 90 CLOSE #1:OPEN #1,8,0,"D:PICTURE"
HL 92 IO=848:POKE IO+2,11:POKE IO+4,PEEK(
   88):POKE IO+5,PEEK(89):POKE IO+8,0:POK
   E IO+9,30
AV 94 JNK=USR(ADR("hhh▣LVⓓ"),16):CLOSE #1
   :GOTO 35
YE 100 REM CITYSCAPE DESIGN
HE 105 GRAPHICS 10:COLOR 4:Y=80:Z=0
SL 110 FOR N=1 TO 14:PLOT 50,80:DRAWTO 0,
   Y:DRAWTO 79,Y:DRAWTO 50,80:Z=Z+0.3:Y=Y
   +Z*Z:NEXT N
AI 115 FOR X=5 TO 75 STEP 8:PLOT X,179:DR
   AWTO 50,80:NEXT X
ZN 120 COLOR 6:PLOT 79,79:DRAWTO 79,0:DRA
   WTO 0,0:POSITION 0,79:POKE 765,6:XIO 1
   8,#6,0,0,"S:"
ET 125 FOR BUILDINGS=1 TO 5
KH 130 X=50-7*BUILDINGS:Y=INT(RND(0)*80)+
   80:Y2=90-(Y-80)
FJ 135 COLOR 5:PLOT X,Y:DRAWTO X,Y2:PLOT
   X-1,Y+1:DRAWTO X-1,Y2-2
XB 140 COLOR 6:PLOT X-2,Y+3:DRAWTO X-2,Y2
   -1:PLOT X-3,Y:DRAWTO X-3,Y2
EH 145 X=55+7*BUILDINGS/2:Y=INT(RND(0)*80
   )+80:Y2=90-(Y-80)
FJ 150 COLOR 6:PLOT X,Y:DRAWTO X,Y2:PLOT
   X-1,Y+1:DRAWTO X-1,Y2-2
YV 155 COLOR 5:PLOT X-2,Y+3:DRAWTO X-2,Y2
   -2:PLOT X-3,Y:DRAWTO X-3,Y2
DS 160 NEXT BUILDINGS
ZY 165 RETURN
ZH 200 REM EYEFRAME CREATES A BORDER
IJ 205 REM SHAPED LIKE AN EYE. FOR SOME
PO 210 REM INTERESTING EFFECTS, TRY
PX 215 REM CHANGING THE VALUE OF Z.
MZ 230 GRAPHICS 10:Z=3.5
EC 235 FOR X=0 TO 178 STEP Z:XCOL=X
WZ 236 IF XCOL=125 THEN XCOL=12
XR 240 COLOR XCOL:PLOT 0,X:DRAWTO X/Z,179
   :PLOT 0,179-X:DRAWTO X/Z,0
BX 245 PLOT 79,X:DRAWTO 79-X/Z,179:PLOT 7
   9,179-X:DRAWTO 79-X/Z,0
LW 250 NEXT X
ZX 255 RETURN
IM 300 REM NAVAJO "EYE OF GOD" DESIGN
WE 310 GRAPHICS 10:C=1
YS 320 FOR Y=1 TO 90:COLOR C:PLOT 0,0:DRA
   WTO 79,179-Y:PLOT 0,179:DRAWTO 79,Y
WC 330 PLOT 79,0:DRAWTO 0,179-Y:PLOT 79,1
   79:DRAWTO 0,Y:C=C+1:IF C=16 THEN C=0
UO 340 NEXT Y:C=1
ZJ 350 FOR X=1 TO 40:COLOR C:PLOT 0,0:DRA
   WTO 79-X,179:PLOT 79,0:DRAWTO X,179
TQ 360 PLOT 0,179:DRAWTO 79-X,0:PLOT 79,1
   79:DRAWTO X,0:C=C+1:IF C=16 THEN C=0
MB 370 NEXT X
ZP 380 RETURN
YL 400 REM FRESCO BORDER, TOP & BOTTOM
BJ 410 GRAPHICS 10:COLOR 5:Y=0:RESTORE 45
   0
LU 420 FOR Z=1 TO 2:READ Y:FOR X=1 TO 70
   STEP 6
GR 430 PLOT X,Y+6:DRAWTO X,Y:DRAWTO X+4,Y
   :DRAWTO X+4,Y+3:DRAWTO X+2,Y+3:DRAWTO
   X+2,Y+6:DRAWTO X+6,Y+6:DRAWTO X+6,Y
VH 440 NEXT X:NEXT Z
GX 450 DATA 5,173
ZM 460 RETURN
IO 500 REM RANDOMLY-COLORED AREA
II 510 REM FOR A PICTURE
VH 515 GRAPHICS 10
LS 520 FOR DOWN=1 TO 179
GT 525 FOR ACROSS=1 TO 78
WO 530 Z=INT(RND(0)*256)
KF 535 IF Z=125 THEN 530
DG 545 POSITION ACROSS,DOWN:? #6;CHR$(Z);

TK 550 NEXT ACROSS
NL 555 NEXT DOWN
ZN 560 RETURN
XU 600 REM "TEXTURES" A PATTERN MAKER
CG 605 REM BY CHANGING THE LETTERS IN
OH 610 REM Z$, OR THE VALUE OF Z (2-38)
DD 615 REM YOU CAN CREATE THOUSANDS OF
UG 620 REM DIFFERENT BACKGROUND TEXTURES
MQ 625 REM FOR YOU  PICTURES. OR,
MU 630 REM OR, REMOVE THE "REM" STATEMENT
   S
EK 635 REM FROM LINES 655 AND 665 AND
CS 640 REM YOU'LL GET A NEW PATTERN
PZ 645 REM EACH TIME YOU PRESS [SELECT]
WK 650 TRAP 655:GRAPHICS 10:Z=38:DIM Z$(3
   9),T$(39)
YQ 655 REM Z=INT(RND(0)*36)+2
QP 660 Z$="ANTIC Magazine<<==>>The ATARI
   Resource"
DR 665 REM FOR X=1 TO 39:Z$(X,X)=CHR$(INT
   (RND(0)*124)):NEXT X
SC 670 FOR Y=1 TO 179:FOR X=1 TO 2:? #6;Z
   $;:NEXT X:? #6:T$=Z$(Z,LEN(Z$)):T$(LEN
   (T$)+1)=Z$(1,Z-1):Z$=T$:NEXT Y
JM 671 TRAP 40000
AF 675 RETURN
TP 700 REM DRAWS A BORDER SHAPED LIKE
UJ 710 REM A TV SCREEN
KG 720 GRAPHICS 10:Y=0.5
YB 730 FOR X=0 TO 178 STEP 2:COLOR X:Y=Y*
   1.055:PLOT 0,X:DRAWTO Y,179:PLOT 0,179
   -X:DRAWTO Y,0
SB 740 PLOT 79,X:DRAWTO 79-Y,179:PLOT 79,
   179-X:DRAWTO 79-Y,0:NEXT X
ZN 750 RETURN
```

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VIDTEX CONVERTER

Article on page 32

LISTING 1

Don't type the TYPO II Codes!

```
YV 10 REM CONVERT MICROPAINTER TO RLE
KZ 20 REM BY CHARLES JACKSON
GL 30 REM (c) 1986, ANTIC PUBLISHING
JY 40 DEBUG=0:IF PEEK(53279)=5 THEN DEBUG
   =1
TX 50 GOTO 80
CJ 60 IF  NOT DEBUG THEN POKE 16,112:POKE
    53774,112
DS 70 POKE 77,0:RETURN
UV 80 BUFSIZE=500
DW 90 DIM FN$(18),OUT$(18),IO$(20),OLD$(1
   ),CUR$(1),MP$(7680),BUFR$(BUFSIZE)
HA 100 GRAPHICS 0:POKE 710,12:POKE 709,0:
   POKE 712,142:GOSUB 60
XN 110 ? "           MICROPAINTER TO RLE ":?
    "           FILE CONVERTER "
YV 120 ? :? "          By Charles Jackson":
   ? :? ,"    (v. 1.2)":? :?
OB 130 MP$(1)="♥":MP$(7680)=MP$:MP$(2)=MP
   $
TQ 140 AD=ADR(MP$):ADHI=INT(AD/256):ADLO=
   AD-ADHI*256
VG 150 ? "File to convert";:INPUT IO$:GOS
   UB 830:FN$=IO$
JY 160 ? :? "Output file";:INPUT IO$:GOSU
   B 830:OUT$=IO$
JO 170 ? :? :? "↖Insert SOURCE disk, ";:G
   OSUB 800
BR 180 TRAP 100:CLOSE #1:OPEN #1,4,0,FN$:
   CLOSE #1
TH 190 GRAPHICS 8:POKE 710,0:POKE 752,1:G
   OSUB 60:GOSUB 680
IJ 200 ? :? "Invert it (Y/N)?";:GOSUB 750

QB 210 ? "↖":? "Are you sure (Y/N)?";
WM 220 POKE 764,255
ZG 230 IF PEEK(764)=43 THEN POKE 764,255:
   INV=1:GOTO 260
IC 240 IF PEEK(764)=35 THEN POKE 764,255:
   POKE 710,0:POKE 709,202:INV=0:? "↖":GO
   TO 200
NI 250 GOTO 230
CY 260 ? "↖":? "Insert DESTINATION disk,
   ";:GOSUB 800
FX 270 IF  NOT DEBUG THEN GRAPHICS 8+48:P
   OKE 710, NOT (INV)*202:POKE 709,INV*20
   2:GOSUB 60
MO 280 TRAP 40000:CLOSE #2:OPEN #2,8,0,OU
   T$:IF DEBUG THEN ? "↖"
TD 290 ? #2;"ЕGH";
AI 300 WHITE=0:BLACK=0:OLD$="*":CUR$="*":
   CHG=0:KNT=0:COL=0:BUFCNT=1:FLUSH=0:SCR
   =PEEK(88)+PEEK(89)*256
NF 310 TRAP 460:POKE 77,0
WS 320 KNT=KNT+1:A=ASC(MP$(KNT,KNT)):COL=
   COL+1
QA 330 IF COL=41 THEN COL=1
VE 340 IF COL<5 THEN 320
QA 350 IF COL>36 THEN 320
HI 360 IF INV=1 THEN A=255-A
VD 370 IF KNT>7680 THEN 460
XU 380 MEM=PEEK(KNT+SCR-1)
VI 390 INVCOL=USR(ADR("hh◘(hI◘◘◘◆"),MEM):
   POKE KNT+SCR-1,INVCOL
EB 400 FOR X=1 TO 8:IF PEEK(53279)=6 THEN
    455
EZ 410 IF A>127 THEN CHG=1:GOSUB 500:GOTO
    430
ZH 420 CHG=0:GOSUB 560
EL 430 A=USR(ADR("hh◘(h◣◘◘◆"),A):REM SHIF
   T BITS LEFT ONE PLACE
RH 440 NEXT X:POKE KNT+SCR-1,MEM
MY 450 GOTO 310
VI 455 GRAPHICS 0:? "◘ABORTED AT YOUR REQ
   UEST!"
KJ 460 FLUSH=1:GOSUB 620:? #2;"ЕGN";:CLOS
   E #1:CLOSE #2:GRAPHICS 0:? OUT$;" IS D
   ONE!"
RO 470 ? :? "Press  START  to re-run"
AR 480 IF PEEK(53279)=6 THEN 100
QP 490 GOTO 480
DR 500 CUR$="B"
KC 510 IF (CUR$<>OLD$) AND (OLD$<>"*") TH
   EN CHG=CHG+1:IF CHG>1 THEN GOSUB 620
DM 520 BLACK=BLACK+1
HC 530 IF BLACK>94 THEN GOSUB 620
AL 540 OLD$="B"
ZL 550 RETURN
NA 560 CUR$="W"
KO 570 IF (CUR$<>OLD$) AND (OLD$<>"*") TH
   EN CHG=CHG+1:IF CHG>1 THEN GOSUB 620
DC 580 WHITE=WHITE+1
UD 590 IF WHITE>94 THEN GOSUB 620
JB 600 OLD$="W"
ZE 610 RETURN
RH 620 BUFR$(BUFCNT,BUFCNT)=CHR$(BLACK+32
   )
OU 630 BUFR$(BUFCNT+1,BUFCNT+1)=CHR$(WHIT
   E+32)
XZ 640 BUFCNT=BUFCNT+2
XP 650 IF (BUFCNT>=BUFSIZE) OR (FLUSH=1)
   THEN ? #2;BUFR$(1,BUFCNT-1);:BUFCNT=1
XS 660 IF DEBUG THEN ? BLACK,WHITE,"(";KN
   T;")"
WZ 670 BLACK=0:WHITE=0:RETURN
BD 680 CLOSE #1:OPEN #1,4,0,FN$
PT 690 IO=848:POKE IO+2,7:POKE IO+4,ADLO:
   POKE IO+5,ADHI:POKE IO+8,0:POKE IO+9,3
   0
BB 700 J=USR(ADR("hhh◘LV◘"),16):CLOSE #1
YS 710 OPEN #1,4,0,FN$
SS 720 POKE IO+2,7:POKE IO+4,PEEK(88):POK
   E IO+5,PEEK(89):POKE IO+8,0:POKE IO+9,
   30
BH 730 J=USR(ADR("hhh◘LV◘"),16):CLOSE #1
ZL 740 RETURN
WX 750 POKE 764,255
TZ 760 IF PEEK(764)=43 THEN INV=0:POKE 71
   0,202:POKE 709,0:GOTO 790:REM YES
TT 770 IF PEEK(764)=35 THEN INV=1:POKE 71
   0,0:POKE 709,202:GOTO 790:REM NO
QY 780 GOTO 760
XZ 790 POKE 764,255:RETURN
PJ 800 POKE 752,1:? "press  START ";
ZR 810 IF PEEK(53279)<>6 THEN 810
ZI 820 RETURN
ME 830 IO$(LEN(IO$)+1)="    "
OM 840 IF IO$(1,2)="D:" OR (IO$(1,1)="D"
   AND IO$(3,3)=":") THEN RETURN
EQ 850 FOR X=LEN(IO$) TO 3 STEP -1
MU 860 IO$(X,X)=IO$(X-2,X-2):NEXT X
FB 870 IO$(1,2)="D:"
ZU 880 RETURN
```

LISTING 2

```
ZH 10 REM CONVERT RLE TO MICROPAINTER
KZ 20 REM BY CHARLES JACKSON
GL 30 REM (c) 1986, ANTIC PUBLISHING
OK 40 BRK=1:IF PEEK(53279)=5 THEN BRK=0
TX 50 GOTO 80
```

```
BV 60 IF BRK THEN POKE 16,112:POKE 53774,112
MO 70 POKE 710,0:POKE 77,0:POKE 752,1:RETURN
YW 80 DIM IN$(18),OUT$(18),IO$(21)
MX 90 GRAPHICS 0:GOSUB 60
RL 100 ? :? "  ◤ CHANGE R.L.E. TO MICROPAINTER ◤"
HN 110 POSITION 2,7:? "RLE file to plot";:INPUT IO$:GOSUB 410:IN$=IO$
MH 120 ? :? "SAVE as ";:INPUT IO$:GOSUB 410:OUT$=IO$
QZ 130 TRAP 90:GRAPHICS 8:GOSUB 60:? "Insert SOURCE disk, press [RETURN]":INPUT #16,IO$
BI 140 CLOSE #1:OPEN #1,4,0,IN$:TRAP 40000
XJ 150 GET #1,A:IF A<>27 THEN 150
OF 160 FOR X=1 TO 2:GET #1,A:NEXT X
ES 170 X=32:Y=0:GRAPHICS 8+16:GOSUB 60:COLOR 1
LL 180 TRAP 310
PV 190 GET #1,BLACK:GET #1,WHITE:POKE 77,0
FT 200 IF (BLACK=27) OR (WHITE=27) THEN 310
TX 210 BLACK=BLACK-32:WHITE=WHITE-32
XD 220 IF BLACK=0 THEN 260
MJ 230 FOR A=1 TO BLACK
NF 240 COLOR 0:PLOT X,Y:X=X+1:IF X>287 THEN Y=Y+1:X=32
VH 250 NEXT A
KX 260 IF WHITE=0 THEN 180
KI 270 FOR A=1 TO WHITE
NY 280 COLOR 1:PLOT X,Y:X=X+1:IF X>287 THEN Y=Y+1:X=32
DI 290 NEXT A
OS 300 GOTO 180
IA 310 CLOSE #1:GRAPHICS 8+32:GOSUB 60
KM 320 ? "Insert DESTINATION disk, press [RETURN]":INPUT #16,IO$
PA 330 TRAP 400:GRAPHICS 8+48:GOSUB 60
IF 340 CLOSE #1:OPEN #1,8,0,OUT$
ZK 350 IO=848:POKE IO+2,11:POKE IO+4,PEEK(88):POKE IO+5,PEEK(89):POKE IO+8,0:POKE IO+9,30
JK 360 JNK=USR(ADR("hhh⊠LV▣"),16)
TO 370 PUT #1,0:PUT #1,2:PUT #1,7:PUT #1,12:CLOSE #1
QC 380 GRAPHICS 0:GOSUB 60
RC 390 POSITION 14,10:? "◙* DONE *◙":GOTO 90
YJ 400 ? "ERROR-";PEEK(186)+PEEK(187)*256:END
LW 410 IO$(LEN(IO$)+1)="    "
OE 420 IF IO$(1,2)="D:" OR (IO$(1,1)="D" AND IO$(3,3)=":") THEN RETURN
EI 430 FOR X=LEN(IO$) TO 3 STEP -1
MM 440 IO$(X,X)=IO$(X-2,X-2):NEXT X
ET 450 IO$(1,2)="D:"
ZM 460 RETURN
```

game of the month

DESERT CHASE

Article on page 20

LISTING 1

Don't type the TYPO II Codes!

```
GR 1 REM DESERT CHASE!
QS 2 REM BY GUY AITCHISON
FR 3 REM (c) 1986, ANTIC PUBLISHING
PE 9 SE=35:DIM A$(2),B$(2),C$(2),D$(2):YE=10:SK=0:SN=1:POKE 106,PEEK(740)
SQ 10 POKE 106,PEEK(106)-5:GRAPHICS 0:DL=(PEEK(106)+1)*256:POKE 756,DL/256+2:DM=PEEK(560)+PEEK(561)*256+6
BB 12 FOR I=0 TO 22:POKE DM+I,4:NEXT I:FOR I=128 TO 500:POKE DL+I,PEEK(57344+I):NEXT I
WA 13 FOR I=1 TO 28:READ O:P=(O+64)*8:FOR A=0 TO 7:READ X:POKE A+P+DL,X:NEXT A:NEXT I:GOSUB 900:VL=0:VH=2
OK 41 POKE DM+5,2:POKE DM+2,5:POKE DM+3,5:POKE DM+6,2:F=999:Q=28:LOCATE 0,0,C:GOSUB 700
CV 47 SOUND 0,255,10,4:SOUND 1,250,10,4:SOUND 2,34,0,4:Z=0
ZL 50 C=C+1:IF C>2 THEN C=0:IF STICK(0)=14 OR STICK(0)=13 THEN GOSUB 100
VE 51 IF C=2 THEN POKE 708,Z+4:POKE 709,Z+6:POKE 711,Z+8
XK 52 IF C=1 THEN POKE 709,Z+4:POKE 711,Z+6:POKE 708,Z+8
BD 53 IF C=0 THEN POKE 711,Z+4:POKE 708,Z+6:POKE 709,Z+8
HY 60 S=STICK(0):X=X-3*(S=11 AND X>60)+3*(S=7 AND X<166):POKE 53248,X:POKE 53249,X+14
JJ 70 IF STRIG(0)=0 AND FF=0 THEN GOSUB 800
GQ 71 IF FF=1 THEN GOSUB 810
GP 80 G=G+1:IF G>SE THEN G=0:GOSUB 600
NY 98 F=F-1:POSITION 11,0:? F;" ":IF F<1 THEN 9999
TS 99 GOTO 50
CT 100 IF STICK(0)=14 THEN W=W+100:IF W>400 THEN W=100
CT 101 IF STICK(0)=13 THEN W=W-100:IF W<100 THEN W=400
WS 102 POSITION 18,22:? "D=";W:RETURN
GL 200 SK=0:SN=4:SE=SE-0.5:GG=GG+1:IF GG>2 THEN GG=0:WA=WA+1:Z=Z+16:IF Z>248 THEN Z=0
TS 202 X1=INT(14*RND(0)+3)*2:X2=INT(14*RND(0)+3)*2:X3=INT(14*RND(0)+3)*2:X4=INT(14*RND(0)+3)*2
QX 203 X5=INT(14*RND(0)+3)*2:IF WA<5 THEN X5=99:SN=3
ZN 204 IF WA<3 THEN X4=99:SN=2
XA 205 IF WA<1 THEN X3=99:SN=1
EM 209 YE=10:POSITION 34,0:? WA+1:RETURN
OO 500 COLOR 97:PLOT 1,18:DRAWTO 39,18
XH 501 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND 2,100,4,14
KR 502 RESTORE 1010:FOR I=11 TO 20:READ C:COLOR C+128:PLOT 0,I:DRAWTO 39,I:NEXT I
IE 503 FOR I=1 TO 100:POKE 704,I:POKE 705,I:NEXT I:POKE 53248,0:POKE 53249,0:COLOR 4
CH 504 PLOT 0,18:DRAWTO 39,18:GOTO 9999
FS 600 YE=YE+1:IF YE=11 THEN A$="▀▌":B$="▌▌":C$="▟▟"
IC 601 IF YE=12 THEN A$="▀▌":B$="▟▟":C$="▚▌":D$="▚▌"
FP 602 IF YE=13 THEN A$="▛▚":B$="▚▌":C$="▜▜":D$="▌▌"
CB 603 IF YE=14 THEN A$="▛▀":B$="▚▯":C$="◢◢":D$="▟▟"
```

continued on next page

```
EM 604 IF YE=15 THEN A$="▀▄▀":B$="▀▀":C$="
   ▀▀":D$="▀▀"
OV 605 IF YE=16 THEN 500
TC 606 IF X1<99 THEN POSITION X1,YE:? A$:
   POSITION X1,YE+1:? B$:POSITION X1,YE+2
   :? C$:IF YE>11 THEN GOSUB 624
JD 607 IF X2<99 THEN POSITION X2,YE:? A$:
   POSITION X2,YE+1:? B$:POSITION X2,YE+2
   :? C$:IF YE>11 THEN GOSUB 620
TJ 608 IF X3<99 THEN POSITION X3,YE:? A$:
   POSITION X3,YE+1:? B$:POSITION X3,YE+2
   :? C$:IF YE>11 THEN GOSUB 621
DP 609 IF X4<99 THEN POSITION X4,YE:? A$:
   POSITION X4,YE+1:? B$:POSITION X4,YE+2
   :? C$:IF YE>11 THEN GOSUB 622
MT 610 IF X5<99 THEN POSITION X5,YE:? A$:
   POSITION X5,YE+1:? B$:POSITION X5,YE+2
   :? C$:IF YE>11 THEN GOSUB 623
AF 619 RETURN
UC 620 POSITION X2,YE-1:? D$:RETURN
UU 621 POSITION X3,YE-1:? D$:RETURN
VM 622 POSITION X4,YE-1:? D$:RETURN
WE 623 POSITION X5,YE-1:? D$:RETURN
TZ 624 POSITION X1,YE-1:? D$:RETURN
IC 700 POSITION 14,3:? " DESERT CHASE ":P
   OSITION 12,4:? " BY GUY AITCHISON "
LD 701 SOUND 0,255,10,14:SOUND 1,254,10,1
   4:SOUND 2,10,10,14:POKE 53768,14
EK 702 C=C+1:IF C>2 THEN C=0
NX 703 IF C=2 THEN POKE 708,Z+4:POKE 709,
   Z+6:POKE 711,Z+8
QD 704 IF C=1 THEN POKE 709,Z+4:POKE 711,
   Z+6:POKE 708,Z+8
TW 705 IF C=0 THEN POKE 711,Z+4:POKE 708,
   Z+6:POKE 709,Z+8
TY 706 Z=Z+16:IF Z>248 THEN Z=0
IF 707 IF STRIG(0)=0 THEN SOUND 0,0,0,0:S
   OUND 1,0,0,0:SOUND 2,0,0,0:Z=0:GOTO 71
   0
PT 709 GOTO 702
LR 710 POSITION 14,3:? "//////////////":P
   OSITION 12,4:? "//////////////////":PO
   P :GOTO 47
VM 800 FF=1:POKE 53250,X+10:XX=X+10:RESTO
   RE 2000:Y=175
EY 802 IF W=400 THEN SP=8
DV 803 IF W=300 THEN SP=7
CS 804 IF W=200 THEN SP=6
BP 805 IF W=100 THEN SP=5
AF 809 RETURN
EL 810 SP=SP-1:Y=Y-SP:READ N:IF N=256 THE
   N POKE PM+512+Y+SP,0:FF=0:GOSUB 820:RE
   TURN
HP 812 POKE PM+512+Y,N:POKE PM+512+Y+SP,0
   :RETURN
XF 820 IF W=400 AND YE=12 OR W=300 AND YE
   =13 OR W=200 AND YE=14 OR W=100 AND YE
   =15 THEN 822
ZL 821 RETURN
EC 822 H=INT((XX/4)-11):J=H-1:IF H=X1 OR
   J=X1 THEN HJ=1:GOTO 830
VG 823 IF H=X2 OR J=X2 THEN HJ=2:GOTO 830
XQ 824 IF H=X3 OR J=X3 THEN HJ=3:GOTO 830
AA 825 IF H=X4 OR J=X4 THEN HJ=4:GOTO 830
CK 826 IF H=X5 OR J=X5 THEN HJ=5:GOTO 830
AJ 829 RETURN
XR 830 POKE 710,14:SOUND 3,20,0,14:IF HJ=
   1 THEN XC=X1:X1=99
WN 831 IF HJ=2 THEN XC=X2:X2=99
YW 832 IF HJ=3 THEN XC=X3:X3=99
BF 833 IF HJ=4 THEN XC=X4:X4=99
DO 834 IF HJ=5 THEN XC=X5:X5=99
AS 835 RESTORE 1010:FOR I=11 TO 20:READ C
   :COLOR C+128:PLOT XC,I:PLOT XC+1,I:NEX
   T I:F=F+30:SOUND 3,0,0,0
UD 836 SK=SK+1:IF SK>SN THEN SK=0:GOSUB 2
   00
DN 837 POKE 710,100:SC=SC+(YE*10):POSITIO
   N 23,0:? SC:RETURN
HL 900 POSITION 0,0:? "      ":POKE 710,100
   :POKE 752,1
MU 901 FOR I=1 TO 5:COLOR 6:PLOT 0,I:DRAW
   TO 39,I:NEXT I:FOR I=8 TO 10:PLOT 0,I:
   DRAWTO 39,I:NEXT I
KG 902 POSITION 0,10:? "▀/▀/▀////▀/▀////
   ▀▀/▀////////▀////▀///////"
CS 903 FOR I=11 TO 23:READ C:COLOR C+128:
   PLOT 0,I:DRAWTO 39,I:NEXT I
CH 910 POKE 559,62:POKE 53277,3:PM=INT(PE
   EK(742)/4-2)*1024:POKE 623,1:POKE 5427
   9,(PM/256)-4
NQ 911 RESTORE 1020:FOR I=177 TO 220 STEP
    2:READ X:POKE I+PM,X:POKE I+PM+1,X:NE
   XT I
VB 912 FOR I=177 TO 220 STEP 2:READ X:POK
   E I+PM+256,X:POKE I+PM+257,X:NEXT I
GV 913 POKE 53248,114:POKE 53249,130:X=11
   4:POKE 53256,1:POKE 53257,1
JE 980 W=100:POSITION 18,22:? "D=";W
LM 989 POSITION 0,6
WF 990 ? " ▀▀                      ▀▀▀       ▀▀
   "
VW 991 ? "      ▀▀▀▀▀      ▀▀▀
   ▀▀▀▀▀"
PN 992 X1=16:X2=24:X3=99:X4=99:X5=99
DE 997 POSITION 5,0:? "FUEL= 999  SCORE=
   0    WAVE= 1 ":POKE 706,28:SP=5:RETURN
OJ 1000 DATA 0,0,0,0,0,0,0,0,0,1,0,0,0,17
   0,85,255,170,170,2,85,85,255,255,170,1
   70,170,170,3,85,85,85,85
AM 1001 DATA 255,255,255,255,4,170,170,17
   0,170,170,170,170,170,5,85,85,85,85,85
   ,85,85,85,6,255,255,255,255
XW 1002 DATA 255,255,255,255,7,255,255,25
   5,243,243,192,192,0,8,252,252,252,240,
   192,192,0,0,9,255,63,15,3,3,0,0,0
NP 1003 DATA 10,1,27,63,63,127,255,62,0,1
   1,128,192,193,227,247,255,12,0,12,0,0,
   128,128,204,255,224,0
ZH 1004 DATA 13,0,16,0,170,69,255,170,170
   ,14,85,85,195,195,170,170,130,170,15,8
   5,80,64,64,255,255,192,255
HT 1005 DATA 16,85,85,21,21,255,255,63,25
   5,17,168,160,160,162,128,170,170,160,1
   8,42,10,10,138,2,170,170,10
VK 1006 DATA 19,64,84,85,85,85,85,85,85,2
   0,1,5,85,85,85,85,85,85
PG 1007 DATA 21,85,85,85,85,85,84,80,64,2
   2,85,85,85,85,85,21,5,1,23,192,192,195
   ,207,0,240,255,255
DV 1008 DATA 24,3,3,195,243,0,15,255,255,
   25,255,255,192,0,192,255,255,255,26,25
   5,255,3,0,3,255,255,255
YV 1009 DATA 33,170,74,8,162,8,74,170,170
MY 1010 DATA 1,2,3,4,5,6,6,4,4,4,5,5,5,5,
   5
FK 1020 DATA 1,1,27,50,117,157,235,150,24
   6,103,3,0,0,0,0,0,1,19,119,255,247
KN 1021 DATA 128,128,216,76,174,185,215,1
   05,111,230,192,0,0,0,0,0,0,128,200,238
   ,255,239,239
IV 2000 DATA 255,255,255,126,126,60,60,24
   ,24,0,0,256
PV 9999 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND
    2,0,0,0:SOUND 3,0,0,0:POSITION 1,6:?
   "              GAME OVER          "
RG 10000 POKE 709,Z+8:FOR I=512 TO 512+25
   6:POKE PM+I,0:NEXT I:POKE 704,0:POKE 7
   05,0:SC=0:F=999
DC 10001 SE=35:SK=0:SN=1:WA=0:YE=10:Z=0:P
   OSITION 34,0:? "1   ":FF=0
OW 10002 POSITION 0,6:? " ▀▀
      ▀▀▀           ▀▀":X1=15:X2=25:X3=99:X4=
   99:X5=99
YJ 10003 X=114:POKE 53248,114:POKE 53249,
   130:POSITION 23,0:? "0      ":POSITION 1
   1,0:? "999 ":GOTO 700
```

LISTING 2

```
OE 10 REM DESERT CHASE!  LISTING 2
XK 20 REM BY GUY AITCHISON
FW 30 REM (c) 1985, ANTIC PUBLISHING
DU 35 REM (CREATES LINES 600-604, 710, 90
   2, 990-991 AND 10002)
CQ 40 REM (LINES 10-220 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IS 45 REM CHANGE LINE 70 AS NECESSARY.)
MG 50 DIM FN$(20),TEMP$(20),AR$(93)
```

```
HO 60 DPL=PEEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
YS 80 GRAPHICS 0:? "      ANTIC'S GENERIC
   BASIC LOADER"
CD 90 ? ,"BY CHARLES JACKSON"
PW 100 POKE 10592,DPL:TRAP 170
PO 110 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LQ 120 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BK 130 AR$="":READ AR$
XW 140 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DG 150 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")       "
UY 160 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 130
MZ 170 IF PEEK(195)=5 THEN ? :? :? "TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CZ 180 IF C<LN+1 THEN ? :? "TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
AL 200 OPEN #1,8,0,FN$
PP 210 POKE 766,1:? #1;A$;:POKE 766,0
AF 220 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
LI 1000 DATA 576
VD 1010 DATA 0540480480320890690610890690
   430490580730700320890690610490490320840
   72069078032065036061034141
WO 1020 DATA 129034058066036061034130130
   0340580670360610341311310341550540480
   49032073070032089069061049050
ZW 1030 DATA 032084072069078032065036061
   0341421300340580660360610341311310340
   58067036061034132132034058068
NY 1040 DATA 036061034129129034155054048
   0500320730700320890690610490510320840
   72069078032065036061034143144
UC 1050 DATA 034058066036061034132132034
   0580670360610341331330340580680360610
   34130130034155054048051032073
KY 1060 DATA 070032089069061049052032084
   0720690780320650360610341451460340580
   66036061034147148034058067036
SA 1070 DATA 061034134134034058068036061
   0341311310341550540480520320730700320
   89069061049053032084072069078
CP 1080 DATA 032065036061034149150034058
   0660360610341511520340580670360610341
   53154034058068036061034132132
MB 1090 DATA 034155055049048032080079083
   0730840730790780320490520440510580630
   32034006006006006006006006006
SP 1100 DATA 006006006006006006034058080
   0790830730840730790780320490500440520
   58063032034006006006006006006
XO 1110 DATA 006006006006006006006006006
   0060006006034058080079080032058071079
   084079032052055155057048050032
CT 1120 DATA 080079083073084073079078032
   0480440490480580630320340070080090070
   06006006008009007008009007006
WD 1130 DATA 006006006008009007006006007
   0080009008009007006006006007007006006
   007008009006006006006006006
WF 1140 DATA 034155057057048032063032034
   0320100120320320320320320320320320320
   32032032032032032032032010011
VS 1150 DATA 012032032032032032032010012
   0341550570570490320630320340320320320
   32010011010011012032032032010
KG 1160 DATA 011012032032032032032032032
   0320320320320320320320320320100110100
   11012034155049048048048050
YH 1170 DATA 032080079083073084073079078
   0320480440540580630320340320100120320
   32032032032032032032032032032
BG 1180 DATA 032032032032032032032010011
   0120320320320320320320100120340580880
   49061049053058088050061050053058
PB 1190 DATA 088051061057057058088052061
   0570570580880530610570571 55
```

---

starting out

NEW OWNERS COLUMN

Article on page 38

LISTING 1

Don't type the TYPO II Codes!

```
PY 10 REM THE NEW OWNER'S COLUMN PART 5
PQ 20 REM BY DAVID PLOTKIN
GL 30 REM (c) 1986, ANTIC PUBLISHING
XS 90 DEG
DA 100 DIM NM$(20),SYN$(3),H1$(3),H2$(3),
   NMPAD$(100):NM$="":H1$="7":H2$="▮":DOT
   =0:FIRST=0:NUMALL=0
FP 105 NMPAD$="789/ SIN COS TAN 456* L10
   +/- ATN 123- LOG EXP SQR 0.=+ X^2 1/X
   Y^X       CLR"
IK 110 GRAPHICS 0:POKE 752,1:SETCOLOR 2,0
   ,0:REM CLEAR THE SCREEN AND MAKE BLACK
    BACKROUND
BQ 120 GOSUB 1000:REM DRAW CALCULATOR
XQ 130 TRAP 1100:REM READ THE STICK
CG 140 POSITION X,Y:PRINT H1$
UU 150 XINC=(STICK(0)=7)*(X<14)-(STICK(0)
   =11)*(X>1)
HF 160 YINC=(STICK(0)=13)*(Y<7)-(STICK(0)
   =14)*(Y>3)
TJ 170 IF XINC=1 AND X=4 THEN XINC=2
YT 180 IF XINC=-1 AND X=6 THEN XINC=-2
CA 190 IF XINC=1 AND X>=6 THEN XINC=4
DE 200 IF XINC=-1 AND X>=10 THEN XINC=-4
HG 210 X=X+XINC:Y=Y+YINC:IF Y=7 THEN X=6
OB 220 INDEX=(Y-3)*17+X:XLEN=(X>=6)*2
GR 230 H1$=NMPAD$(INDEX,INDEX+XLEN)
TL 240 H2$="":FOR LOOP=1 TO LEN(H1$):H2$(
   LOOP,LOOP)=CHR$(ASC(H1$(LOOP,LOOP))+12
   8):NEXT LOOP
SF 250 POSITION X,Y:PRINT H2$:IF STRIG(0)
   =1 THEN FOR WAIT=1 TO 20:NEXT WAIT:GOT
   O 130
ZV 252 IF STRIG(0)=0 THEN 252
FX 253 IF H1$="CLR" THEN HOLD=0:FIRST=0:D
   OT=0:NM$="":SYN$="":POSITION 1,1
MW 254 IF H1$="CLR" THEN PRINT "
          ":NUMALL=0:GOTO 130
BY 255 IF LEN(NM$)>16 OR NUMALL=1 THEN 28
   0
EW 260 IF (X<4 AND Y<6) OR (X=1 AND Y=6)
   THEN NM$(LEN(NM$)+1)=H1$:REM LOOK FOR
   A NUMBER
IK 270 IF (X=2 AND Y=6) AND DOT=0 THEN DO
   T=1:NM$(LEN(NM$)+1)=H1$:REM DECIMAL PO
   INT ADDED TO NUMBER
```

continued on next page

```
JY 280 POSITION 1,1:PRINT "
       ":POSITION 18-LEN(NM$),1:PRINT NM$
AD 282 IF LEN(NM$)=0 AND FIRST=0 THEN NM$
   =STR$(HOLD)
NZ 285 IF LEN(NM$)=0 THEN 130
EI 290 IF X<>4 THEN GOTO 350:REM ARITHMET
   IC OPERATORS
PQ 300 IF FIRST=0 THEN FIRST=1:HOLD=VAL(N
   M$):NM$="":SYN$=H1$:DOT=0:NUMALL=0:GOT
   O 130
ST 310 GOSUB 600
ME 345 NM$=STR$(HOLD):POSITION 18-LEN(NM$
   ),1:PRINT NM$:NM$="":SYN$=H1$:DOT=0:NU
   MALL=0:GOTO 130
RU 350 IF X=3 AND Y=6 THEN GOSUB 600:FIRS
   T=0:POSITION 1,1:PRINT "
     ":GOTO 345:REM =
AP 360 IF X<6 THEN 130
OZ 370 IF H1$="SIN" THEN HOLD2=SIN(VAL(NM
   $))
IF 380 IF H1$="COS" THEN HOLD2=COS(VAL(NM
   $))
IB 390 IF H1$="TAN" THEN HOLD2=SIN(VAL(NM
   $))/COS(VAL(NM$))
ZG 400 IF H1$="L10" THEN HOLD2=CLOG(VAL(N
   M$))
JH 410 IF H1$="+/-" THEN HOLD2=-(VAL(NM$)
   )
EE 420 IF H1$="ATN" THEN HOLD2=ATN(VAL(NM
   $))
BE 430 IF H1$="LOG" THEN HOLD2=LOG(VAL(NM
   $))
VC 440 IF H1$="EXP" THEN HOLD2=EXP(VAL(NM
   $))
JM 450 IF H1$="SQR" THEN HOLD2=SQR(VAL(NM
   $))
KI 460 IF H1$="X^2" THEN HOLD2=VAL(NM$)*V
   AL(NM$)
OP 470 IF H1$="1/X" THEN HOLD2=1/VAL(NM$)

KN 480 IF H1$="Y^X" THEN POSITION 1,1:PRI
   NT "                 ":POSITION 18-LEN
   (NM$),1:PRINT NM$:GOTO 300
ET 500 NM$=STR$(HOLD2):POSITION 1,1:PRINT
   "                  ":POSITION 18-LEN(N
   M$),1:PRINT NM$:NUMALL=1:GOTO 130
PE 600 IF SYN$="/" THEN HOLD=HOLD/VAL(NM$
   )
GP 610 IF SYN$="*" THEN HOLD=HOLD*VAL(NM$
   )
LW 620 IF SYN$="-" THEN HOLD=HOLD-VAL(NM$
   )
IM 630 IF SYN$="+" THEN HOLD=HOLD+VAL(NM$
   )
RO 635 IF SYN$="Y^X" THEN HOLD=HOLD^VAL(N
   M$)
ZK 640 RETURN
PR 999 END
VU 1000 REM DRAW THE CALCULATOR
KZ 1010 POSITION 0,0:PRINT CHR$(17):POSIT
   ION 18,0:PRINT CHR$(5)
ZX 1020 POSITION 0,8:PRINT CHR$(26):POSIT
   ION 18,8:PRINT CHR$(3)
NP 1030 FOR LOOP=1 TO 17:POSITION LOOP,0:
   PRINT CHR$(18):POSITION LOOP,8:PRINT C
   HR$(18)
WH 1035 POSITION LOOP,2:PRINT CHR$(18):NE
   XT LOOP
LS 1040 FOR LOOP=1 TO 7:POSITION 0,LOOP:P
   RINT CHR$(124):POSITION 18,LOOP:PRINT
   CHR$(124):NEXT LOOP
IM 1045 POSITION 0,2:PRINT CHR$(1):POSITI
   ON 18,2:PRINT CHR$(4)
NM 1050 POSITION 1,3:PRINT "789/ SIN COS
   TAN"
BK 1060 POSITION 1,4:PRINT "456* L10 +/-
   ATN"
YO 1070 POSITION 1,5:PRINT "123- LOG EXP
   SQR"
AZ 1080 POSITION 1,6:PRINT "0.=+ X^2 1/X
   Y^X"
BA 1085 POSITION 6,7:PRINT "CLR":X=1:Y=3:
   POSITION X,Y:PRINT "█"
BA 1090 RETURN
WC 1100 REM ERROR ROUTINE
YV 1110 POSITION 1,1:PRINT "
       ":POSITION 7,1:PRINT "ERROR"
IR 1120 HOLD=0:FIRST=0:DOT=0:NM$="":SYN$=
   "":NUMALL=0
PO 1130 FOR LOOP=1 TO 250:NEXT LOOP
OQ 1140 GOTO 130
```

RLE TESTER

LISTING 1

Don't type the TYPO II Codes!

```
ZR 10 REM RLE TESTER
NK 20 REM BY C. JACKSON
GL 30 REM (c) 1986, ANTIC PUBLISHING
XN 40 REM All Rights Reserved
BC 50 REM
XY 60 GRAPHICS 0:POKE 710,0:POKE 752,1
DR 70 ? :? "  This program creates an RLE
   "
XX 80 ? "disk file called TEST.RLE."
TH 90 ?
MU 100 ? "  You can use this file to test
   "
IR 110 ? "the RLE generator programs"
PO 120 ? "found in this issue."
CK 130 ?
NM 140 ? "  When displayed, this RLE"
IA 150 ? "image will look like a large"
HR 160 ? "white box with a small black"
FE 170 ? "box in the center."
PK 180 ? :? " Press START to create"
TU 190 ? "the RLE file."
```

```
UZ 200 POKE 752,255
SZ 210 IF PEEK(53279)<>6 THEN 210
LC 220 CLOSE #1
BY 230 GRAPHICS 0:POKE 710,0:POKE 752,1
FS 240 POSITION 10,10:? "WORKING..."
KX 250 OPEN #1,8,0,"D:TEST.RLE"
SP 260 ? #1;"⋿GH";
FT 270 FOR X=1 TO 88
CP 280 ? #1;" ▸ ▸ b";
ME 290 NEXT X
ZQ 300 FOR X=1 TO 16
HA 310 ? #1;" ▸ 90▸ 9";
LR 320 NEXT X
FM 330 FOR X=1 TO 88
CI 340 ? #1;" ▸ ▸ b";
LX 350 NEXT X
VQ 360 ? #1;"⋿GN";
LN 370 CLOSE #1
BJ 380 GRAPHICS 0:POKE 710,0
MS 390 POSITION 10,10:? "COMPLETED":POK
   E 752,0
NT 400 END
```

ST RESOURCE

GRAFCON ST

Article on page 67

LISTING 1

```
/*
 *  Graphics Resolution Converter
 *  File: GRAFCON.C
 *  version 032586 Tuesday Edition
 *  (c) 1986 Antic Publishing
 *  Written by Patrick Bass
 *
 *  The purpose of this program is to convert a color
 *   picture to black & white, and uh...  vice-versa.
 *
 *---- Alcyon Include File ------------------*/

#include        "osbind.h"

#define    TRUE             (1)
#define    FALSE            (0)
#define    CANCEL           (0)
#define    NO               (2)
#define    ERROR            (-1)
#define    begin            {
#define    end              }
#define    wend             }
#define    repeat           }
#define    next             }
#define    endif            }
#define    not              !
#define    equals           ==
#define    does_not_equal   !=
#define    then
#define    AND              &&
#define    ORed_with        |
#define    DELAY            for( delay=0; delay<32767; delay++ );
#define    NEO              1
#define    DEGAS            2
#define    DOODLE           3
#define    LOREZ            0
#define    MEDREZ           1
#define    HIREZ            2
#define    SIMPLE           1
```

continued on next page

```
#define    COMPLEX        2
#define    RLE            2
#define    FLATHAND       4
#define    ARROW          0
#define    ESC            27
#define    NOTOKEN        0
#define    WTOKEN         1
#define    BTOKEN         2
#define    WHITE          0
#define    BLACK          1

/*---------------- Alcyon Declarations/Equates --------*/
int   contrl[ 12 ],
      intin[ 256 ],  ptsin[ 256 ],
      intout[ 256 ], ptsout[ 256 ],
      workin[]={ 1,1,1,1,1,1,1,1,1,1,2 }, workout[ 57 ],
      i, j, k, l, character, type_picture, src_rez, dest_rez,
      read_rez, resolution, type_conversion, src_type, dest_type,
      write_rez, len_pixline, mx, xres, my, yres, color, max_color,
      delay, drive, top, bottom, dum, lo_word, hi_word,
      handle, file_handle, read_handle, pix_handle,
      for_reading, temp_pixel, action_desired,
      bytes_read, button, pressed, finished, rle_able, rle_index,
      box_width, box_height, box_sx, box_sy, box_fx, box_fy,
      x_offset[]={ 96, 192, 192 }, y_offset[]={ 4, 4, 104 },
      white, black, old, current, change,
      new_palette[ 16 ], org_palette[ 16 ];

char  src_picture[ 32767 ], dest_picture[ 32767 ],
      rle_buffer[ 32767 ],  neo_buffer[ 1000 ],

      path[]="a:*.*\0",
      in_filename[]="filename.ext\0",
      out_filename[]="filename.ext\0",

      rlealert[]="[3][ Format or RLE conversion? ][Format|RLE]",
      alert0[]="[1][ Welcome to | GrafCon/520 | v.032586 ][ Perform ]",
      oreadalert[]="[3][ Select the picture to convert. ][ Select ]",
      owritealert[]="[3][ Select the file to write to. ][ Select ]",
      stypealert[]="[3][ Source picture is type: ][Neo|Degas|Doodle]",
      dtypealert[]="[3][ Dest picture will be type: ][Neo|Degas|Doodle]",
      srezalert[]="[3][ Source resolution is ? ][ Lo | Med | Hi ]",
      drezalert[]="[3][ Dest resolution will be ? ][ Lo | Med | Hi ]",
      simalert[]="[3][ Type of Hi-res conversion?][ Simple | Complex ]",
      pralert[]="[3][ When conversion is|finished, press mouse key.][Go]",
      alert3[]="[3][ Convert another picture? ][ Yes | No ]",
      alert4[]="[3][ Thanks for using | GrafCon/520 | v.032586 ][ Exit ]",
      owrlealert[]="[3][ Select an RLE file to write to.][ Choose it ]";

long  max_len=32767, write_handle, write_bytes,
      org_pix, src_pix, des_pix, answer, temp_answer;

/*------------------------------------------------------------------*/
main()
begin
      initialize();

      do begin

            if( rle_able ) then rle_conversion();
            if( not rle_able ) then graphics_conversion();

      repeat while( not finished );

      terminate();
end

/*----------------------------------*/
graphics_conversion()
```

```
begin
      select_parameters();
      read_the_picture();
      convert_the_picture();
      wait_for_mousepress();
      write_the_picture();

      button=form_alert( 2, alert3 );
      if( button equals NO ) then finished=TRUE;
end

/*---------------------------------*/
initialize()
begin
      appl_init();
      handle=graf_handle( &i, &i, &i, &i );
      v_opnvwk( workin, &handle, workout );
      xres=workout[ 0 ]; yres=workout[ 1 ];
      max_color=( workout[ 13 ]-1 );
      for( i=0; i<16; i++ ) begin
            new_palette[ i ]=org_palette[ i ]=Setcolor( i, -1 );
      next

      org_pix=Physbase();
      src_pix=( ( 0xffff00 & src_picture )+0x0100 );
      des_pix=( ( 0xffff00 & dest_picture )+0x0100 );

      resolution=Getrez();
      box_width=256; box_height=192;
      form_alert( 1, alert0 );
      finished=FALSE;
      for_reading=0;
      len_pixline=40;
      top=0; bottom=200;
      rle_able=FALSE;

      type_conversion=form_alert( 2, rlealert );
      if( type_conversion equals RLE ) then rle_able=TRUE;
end

/*---------------------------*/
wait_for_mousepress()
begin
      int  mx, my, pressed, dum;

      do begin
            graf_mkstate( &mx, &my, &pressed, &dum );
      repeat while( not pressed );
end

/*---------------------------*/
select_parameters()
begin
      src_type=form_alert( 2, stypealert );
            DELAY
      src_rez=form_alert( 1, srezalert );
            DELAY
      dest_type=form_alert( 2, dtypealert );
            DELAY
      dest_rez=form_alert( 1, drezalert );
            DELAY
      src_rez=src_rez-1; dest_rez=dest_rez-1; write_rez=dest_rez;

      type_conversion=COMPLEX;
      if(( src_rez equals HIREZ )AND( dest_rez equals LOREZ )) then begin
            type_conversion=form_alert( 2, simalert );
      endif
end
```

continued on next page

```
/*---------------------------*/
read_the_picture()
begin
      char   *source, *dest;

      form_alert( 1, oreadalert );
      drive=Dgetdrv();
      path[ 0 ]=( drive+'A' );

      fsel_input( path, in_filename, &button );
      if( button does_not_equal CANCEL ) then begin

            form_alert( 1, pralert );
            Setscreen( src_pix, src_pix, -1 );
            v_hide_c( handle );
            read_handle=Fopen( in_filename, for_reading );
            if( read_handle > ERROR ) then begin

                  if( src_type equals NEO ) then begin
                        Fread( read_handle, 4L, neo_buffer );
                        Fread( read_handle, 32L, new_palette );
                        Fread( read_handle, 12L, out_filename );
                        Fread( read_handle, 80L, neo_buffer );
                        Fread( read_handle, 32000L, src_pix );
                  endif

                  if( src_type equals DEGAS ) then begin
                        Fread( read_handle, 2L, read_rez );
                        Fread( read_handle, 32L, new_palette );
                        Fread( read_handle, 32000L, src_pix );
                  endif

                  if( src_type equals DOODLE ) then begin
                        Fread( read_handle, 32000L, src_pix );
                  endif
            endif
            Fclose( read_handle );
            Setpallete( new_palette );
      endif
      Setscreen( des_pix, des_pix, -1 );
      source=src_pix;
      dest=des_pix;
      for( i=0; i<32000; i++ ) begin
            ( *dest++ )=( *source++ );
      next
      v_show_c( handle );
end

/*-----------------------------------*/
convert_the_picture()
begin
      if( src_rez equals LOREZ ) then con_lorez();
      if( src_rez equals MEDREZ ) then con_medrez();
      if( src_rez equals HIREZ ) then con_hirez();
end

/*-----------------------------------*/
con_lorez()
begin
      if( dest_rez equals LOREZ ) then wait_for_mousepress();
      if( dest_rez equals MEDREZ ) then lomed();
      if( dest_rez equals HIREZ ) then lohi();
end

/*-----------------------------------*/
lomed()
begin
```

```
/*        This procedure available next month        */
end

/*---------------------------------*/
lohi()
begin
```

The following section of GrafCon-ST converts low resolution to high resolution. If you don't need this particular conversion, just leave out all lines down to the next **end** statement.

```
        int  *src, *upper_dest, *lower_dest,
             pixword,
             lo0_pixword, hi0_pixword,
             lo1_pixword, hi1_pixword,
             pixlo1, pixlo0, pixhi1, pixhi0,
             row, column;

        v_hide_c( handle );
        Setscreen( des_pix, des_pix, -1 );
        Setpallete( new_palette );
        src=src_pix;
        upper_dest=des_pix;

        for( row=top; row<bottom; row++ ) begin
             for( column=0; column<20; column++ ) begin

                  hi0_pixword=( *src++ ); lo0_pixword=( *src++ );
                  hi1_pixword=( *src++ ); lo1_pixword=( *src++ );

                  blend( hi0_pixword, lo0_pixword );
                  pixhi0=hi_word; pixlo0=lo_word;
                  blend( hi1_pixword, lo1_pixword );
                  pixhi1=hi_word; pixlo1=lo_word;

                  lower_dest=( upper_dest+len_pixline );
                  ( *upper_dest++ )=pixhi0; ( *upper_dest++ )=pixlo0;
                  ( *lower_dest++ )=pixhi1; ( *lower_dest )=pixlo1;
             next
             upper_dest=upper_dest+len_pixline;
        next
        v_show_c( handle );
end

/*---------------------------------*/
blend( leftword, rightword )
int  leftword, rightword;
begin
        hi_word=lo_word=0;

        if( leftword&0x8000 ) then hi_word=hi_word ORed_with 0x8000;
        if( rightword&0x8000 ) then hi_word=hi_word ORed_with 0x4000;
        if( leftword&0x4000 ) then hi_word=hi_word ORed_with 0x2000;
        if( rightword&0x4000 ) then hi_word=hi_word ORed_with 0x1000;

        if( leftword&0x2000 ) then hi_word=hi_word ORed_with 0x0800;
        if( rightword&0x2000 ) then hi_word=hi_word ORed_with 0x0400;
        if( leftword&0x1000 ) then hi_word=hi_word ORed_with 0x0200;
        if( rightword&0x1000 ) then hi_word=hi_word ORed_with 0x0100;

        if( leftword&0x0800 ) then hi_word=hi_word ORed_with 0x0080;
        if( rightword&0x0800 ) then hi_word=hi_word ORed_with 0x0040;
        if( leftword&0x0400 ) then hi_word=hi_word ORed_with 0x0020;
        if( rightword&0x0400 ) then hi_word=hi_word ORed_with 0x0010;

        if( leftword&0x0200 ) then hi_word=hi_word ORed_with 0x0008;
        if( rightword&0x0200 ) then hi_word=hi_word ORed_with 0x0004;
        if( leftword&0x0100 ) then hi_word=hi_word ORed_with 0x0002;
        if( rightword&0x0100 ) then hi_word=hi_word ORed_with 0x0001;
```

continued on next page

```
      if( leftword&0x0080 ) then lo_word=lo_word ORed_with 0x8000;
      if( rightword&0x0080 ) then lo_word=lo_word ORed_with 0x4000;
      if( leftword&0x0040 ) then lo_word=lo_word ORed_with 0x2000;
      if( rightword&0x0040 ) then lo_word=lo_word ORed_with 0x1000;

      if( leftword&0x0020 ) then lo_word=lo_word ORed_with 0x0800;
      if( rightword&0x0020 ) then lo_word=lo_word ORed_with 0x0400;
      if( leftword&0x0010 ) then lo_word=lo_word ORed_with 0x0200;
      if( rightword&0x0010 ) then lo_word=lo_word ORed_with 0x0100;

      if( leftword&0x0008 ) then lo_word=lo_word ORed_with 0x0080;
      if( rightword&0x0008 ) then lo_word=lo_word ORed_with 0x0040;
      if( leftword&0x0004 ) then lo_word=lo_word ORed_with 0x0020;
      if( rightword&0x0004 ) then lo_word=lo_word ORed_with 0x0010;

      if( leftword&0x0002 ) then lo_word=lo_word ORed_with 0x0008;
      if( rightword&0x0002 ) then lo_word=lo_word ORed_with 0x0004;
      if( leftword&0x0001 ) then lo_word=lo_word ORed_with 0x0002;
      if( rightword&0x0001 ) then lo_word=lo_word ORed_with 0x0001;
end

/*--------------------------------*/
separate( leftword, rightword )
int  leftword, rightword;
begin
      hi_word=lo_word=0;

      if( leftword&0x8000 ) then hi_word=hi_word ORed_with 0x8000;
      if( leftword&0x4000 ) then lo_word=lo_word ORed_with 0x8000;
      if( leftword&0x2000 ) then hi_word=hi_word ORed_with 0x4000;
      if( leftword&0x1000 ) then lo_word=lo_word ORed_with 0x4000;
      if( leftword&0x0800 ) then hi_word=hi_word ORed_with 0x2000;
      if( leftword&0x0400 ) then lo_word=lo_word ORed_with 0x2000;
      if( leftword&0x0200 ) then hi_word=hi_word ORed_with 0x1000;
      if( leftword&0x0100 ) then lo_word=lo_word ORed_with 0x1000;

      if( leftword&0x0080 ) then hi_word=hi_word ORed_with 0x0800;
      if( leftword&0x0040 ) then lo_word=lo_word ORed_with 0x0800;
      if( leftword&0x0020 ) then hi_word=hi_word ORed_with 0x0400;
      if( leftword&0x0010 ) then lo_word=lo_word ORed_with 0x0400;

      if( leftword&0x0008 ) then hi_word=hi_word ORed_with 0x0200;
      if( leftword&0x0004 ) then lo_word=lo_word ORed_with 0x0200;
      if( leftword&0x0002 ) then hi_word=hi_word ORed_with 0x0100;
      if( leftword&0x0001 ) then lo_word=lo_word ORed_with 0x0100;

      if( rightword&0x8000 ) then hi_word=hi_word ORed_with 0x0080;
      if( rightword&0x4000 ) then lo_word=lo_word ORed_with 0x0080;
      if( rightword&0x2000 ) then hi_word=hi_word ORed_with 0x0040;
      if( rightword&0x1000 ) then lo_word=lo_word ORed_with 0x0040;

      if( rightword&0x0800 ) then hi_word=hi_word ORed_with 0x0020;
      if( rightword&0x0400 ) then lo_word=lo_word ORed_with 0x0020;
      if( rightword&0x0200 ) then hi_word=hi_word ORed_with 0x0010;
      if( rightword&0x0100 ) then lo_word=lo_word ORed_with 0x0010;

      if( rightword&0x0080 ) then hi_word=hi_word ORed_with 0x0008;
      if( rightword&0x0040 ) then lo_word=lo_word ORed_with 0x0008;
      if( rightword&0x0020 ) then hi_word=hi_word ORed_with 0x0004;
      if( rightword&0x0010 ) then lo_word=lo_word ORed_with 0x0004;

      if( rightword&0x0008 ) then hi_word=hi_word ORed_with 0x0002;
      if( rightword&0x0004 ) then lo_word=lo_word ORed_with 0x0002;
      if( rightword&0x0002 ) then hi_word=hi_word ORed_with 0x0001;
      if( rightword&0x0001 ) then lo_word=lo_word ORed_with 0x0001;
end

/*--------------------------------*/
con_medrez()
```

```
begin
      if( dest_rez equals LOREZ ) then medlo();
      if( dest_rez equals MEDREZ ) then wait_for_mousepress();
      if( dest_rez equals HIREZ ) then medhi();
end

/*--------------------------------------*/
medlo()
begin

/*          This procedure available next month      */

end

/*--------------------------------------*/
medhi()
begin

/*          This procedure available next month      */

end

/*--------------------------------------*/
con_hirez()
begin
      if( dest_rez equals LOREZ ) then hilo();
      if( dest_rez equals MEDREZ ) then himed();
      if( dest_rez equals HIREZ ) then wait_for_mousepress();
end

/*--------------------------------------*/
hilo()
begin
```

The following section of GrafCon-ST converts high resolution to low resolution. If you don't need this particular conversion, just leave out all lines down to the next **end** statement.

```
      int   *upper_src, *lower_src, *dest,
            pixword, lo_pixword, hi_pixword,
            pixlo1, pixlo2, pixhi1, pixhi2,
            row, column;

      v_hide_c( handle );
      Setscreen( des_pix, des_pix, -1 );
      Setpallete( new_palette );
      upper_src=src_pix;
      dest=des_pix;

      for( row=top; row<bottom; row++ ) begin
            for( column=0; column<20; column++ ) begin

                  lower_src=( upper_src+len_pixline );

                  if( type_conversion equals SIMPLE ) then begin
                        pixhi1=( *upper_src++ ); pixhi2=( *upper_src++ );
                        pixhi1=condense( pixhi1, pixhi2 );

                        pixlo1=( *lower_src++ ); pixlo2=( *lower_src );
                        pixlo1=condense( pixlo1, pixlo2 );

                        pixhi1=pixhi1 ORed_with pixlo1;
                        pixhi2=0;
                        pixlo1=0;
                        pixlo2=0;
                  endif

                  if( type_conversion equals COMPLEX ) then begin
                        pixhi1=( *upper_src++ ); pixhi2=( *upper_src++ );
                        separate( pixhi1, pixhi2 );
                        pixhi1=hi_word; pixhi2=lo_word;
```

continued on next page

```
                    pixlo1=( *lower_src++ ); pixlo2=( *lower_src );
                    separate( pixlo1, pixlo2 );
                    pixlo1=hi_word; pixlo2=lo_word;
               endif

               ( *dest++ )=pixhi1; ( *dest++ )=pixhi2;
               ( *dest++ )=pixlo1; ( *dest++ )=pixlo2;

          next
          upper_src=upper_src+len_pixline;
     next
     v_show_c( handle );
end

/*----------------------------------*/
himed()
begin
/*       This procedure available next month     */
end

/*----------------------------------*/
write_the_picture()
begin
     Setscreen( org_pix, org_pix, -1 );
     Setpallete( org_palette );

     form_alert( 1, owritealert );
     pix_handle=ERROR;
     fsel_input( path, out_filename, &button );
     v_hide_c( handle );
     Setscreen( des_pix, des_pix, -1 );
     Setpallete( new_palette );

     if( button does_not_equal CANCEL ) then begin
          pix_handle=Fcreate( out_filename, 0 );

          if( pix_handle > ERROR ) then begin

               if( dest_type equals NEO ) then begin
                    Fwrite( pix_handle, 4L, &neo_buffer );
                    Fwrite( pix_handle, 32L, &new_palette );
                    Fwrite( pix_handle, 12L, &out_filename );
                    Fwrite( pix_handle, 80L, &neo_buffer );
                    Fwrite( pix_handle, 32000L, des_pix );
               endif

               if( dest_type equals DEGAS ) then begin
                    Fwrite( pix_handle, 2L, &write_rez );
                    Fwrite( pix_handle, 32L, &new_palette );
                    Fwrite( pix_handle, 32000L, des_pix );
               endif

               if( dest_type equals DOODLE ) then begin
                    Fwrite( pix_handle, 32000L, des_pix );
               endif
          endif
          Fclose( pix_handle );
     endif
     Setscreen( org_pix, org_pix, -1 );
     Setpallete( org_palette );
     v_show_c( handle );
end

/*----------------------------------*/
int
condense( leftword, rightword )
int  leftword, rightword;
begin
```

```
        int   word_out;

        word_out=0;

        if( leftword&0xc000 ) then word_out=word_out ORed_with 0x8000;
        if( leftword&0x3000 ) then word_out=word_out ORed_with 0x4000;
        if( leftword&0x0c00 ) then word_out=word_out ORed_with 0x2000;
        if( leftword&0x0300 ) then word_out=word_out ORed_with 0x1000;
        if( leftword&0x00c0 ) then word_out=word_out ORed_with 0x0800;
        if( leftword&0x0030 ) then word_out=word_out ORed_with 0x0400;
        if( leftword&0x000c ) then word_out=word_out ORed_with 0x0200;
        if( leftword&0x0003 ) then word_out=word_out ORed_with 0x0100;

        if( rightword&0xc000 ) then word_out=word_out ORed_with 0x0080;
        if( rightword&0x3000 ) then word_out=word_out ORed_with 0x0040;
        if( rightword&0x0c00 ) then word_out=word_out ORed_with 0x0020;
        if( rightword&0x0300 ) then word_out=word_out ORed_with 0x0010;

        if( rightword&0x00c0 ) then word_out=word_out ORed_with 0x0008;
        if( rightword&0x0030 ) then word_out=word_out ORed_with 0x0004;
        if( rightword&0x000c ) then word_out=word_out ORed_with 0x0002;
        if( rightword&0x0003 ) then word_out=word_out ORed_with 0x0001;

        return( word_out );
end
```

The following section of GrafCon-ST converts ST graphics to RLE format for uploading to CompuServe. If you don't need this particular conversion, just leave out all lines down to the final **terminate( )** section.

```
/*----------------------------------*/
rle_conversion()
begin
        src_type=form_alert( 2, stypealert );
             DELAY
        src_rez=form_alert( 1, srezalert );
             DELAY
        read_the_picture();
        find_area_to_convert();
        rle_the_box();
        Setpallete( org_palette );

        button=form_alert( 2, alert3 );
        if( button equals NO ) then finished=TRUE;
end

/*----------------------------------*/
rle_the_box()
begin
        int   row, column, box[ 10 ],
              element, pixel, new_pixel,
              mx, my, pressed, dum;

        white=0; black=0;
        change=FALSE;
        current=NOTOKEN;
        old=NOTOKEN;

        rle_index=0;
        rle_buffer[ rle_index++ ]=ESC;
        rle_buffer[ rle_index++ ]='G';
        rle_buffer[ rle_index++ ]='H';

        vsl_color( handle, BLACK );
        box[ 0 ]=box_fx-1; box[ 1 ]=box_fy-1;
        box[ 2 ]=box_fx+box_width; box[ 3 ]=box_fy-1;
        box[ 4 ]=box_fx+box_width; box[ 5 ]=box_fy+box_height+1;
        box[ 6 ]=box_fx-1; box[ 7 ]=box_fy+box_height+1;
        box[ 8 ]=box_fx-1; box[ 9 ]=box_fy-1;
        v_pline( handle, 5, box );
```

continued on next page

```
    v_hide_c( handle );
    for( row=box_fy; row<box_fy+box_height; row++ ) begin
         for( column=box_fx; column<box_fx+box_width; column++ ) begin

              v_get_pixel( handle, column, row, &element, &pixel );

              if( element ) then begin
                   change=TRUE;
                   blk_handle();
              endif
              if( not element ) then begin
                   change=FALSE;
                   wht_handle();
              endif

              vsl_color( handle, ( max_color-pixel ));
              box[ 0 ]=box[ 2 ]=column;
              box[ 1 ]=box[ 3 ]=row;
              v_pline( handle, 2, box );

              graf_mkstate( &mx, &my, &pressed, &dum );
              if( pressed ) then begin
                   column=box_fx+box_width;
                   row=box_fy+box_height;
              endif
         next
    next
    v_show_c( handle );
    w_record();
    rle_buffer[ rle_index++ ]=ESC;
    rle_buffer[ rle_index++ ]='G';
    rle_buffer[ rle_index++ ]='N';

    form_alert( 1, owrlealert );
    pix_handle=ERROR;
    Setscreen( org_pix, org_pix, -1 );
    Setpallete( org_palette );
    fsel_input( path, out_filename, &button );
    v_hide_c( handle );

    if( button does_not_equal CANCEL ) then begin
         pix_handle=Fcreate( out_filename, 0 );

         if( pix_handle > ERROR ) then begin
              Fwrite( pix_handle, (long)rle_index+1, rle_buffer );
         endif

         Fclose( pix_handle );
    endif
    v_show_c( handle );
end

/*---------------------------------*/
blk_handle()
begin
    current=BTOKEN;

    if(( current does_not_equal old )AND
       ( old does_not_equal NOTOKEN )) then begin
         change++;
         if( change>TRUE ) then w_record();
    endif

    black++;
    if( black > 94 ) then w_record();
    old=BTOKEN;
end

/*---------------------------------*/
```

```
wht_handle()
begin
      current=WTOKEN;

      if(( current does_not_equal old )AND
         ( old does_not_equal NOTOKEN )) then begin
            change++;
            if( change>TRUE ) then w_record();
      endif
      white++;
      if( white > 94 ) then w_record();
      old=WTOKEN;
end

/*-----------------------------------*/
w_record()
begin
      rle_buffer[ rle_index++ ]=( black+32 );
      rle_buffer[ rle_index++ ]=( white+32 );
      black=white=0;
end

/*-----------------------------------*/
find_area_to_convert()
begin
      int   off_x, off_y;

      off_x=x_offset[ resolution ]; off_y=y_offset[ resolution ];
      graf_growbox( 0, 0, 2, 2, off_x, off_y, box_width, box_height );
      graf_mouse( FLATHAND, 0x0L );
      wait_for_mousepress();

      do begin
            graf_dragbox( box_width, box_height, off_x, off_y,
                          0, 0, xres-1, yres-1,
                          &box_fx, &box_fy );
            graf_mkstate( &mx, &my, &pressed, &dum );
      repeat while( pressed );

      graf_shrinkbox( 0, 0, 2, 2, box_fx, box_fy, box_width, box_height );
      graf_mouse( ARROW, 0x0L );
end

/*-----------------------------------*/
terminate()
begin
      form_alert( 1, alert4 );
      v_clsvwk( handle );
      appl_exit();
end
```

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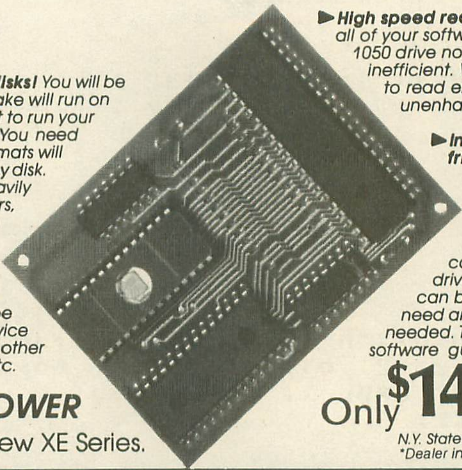
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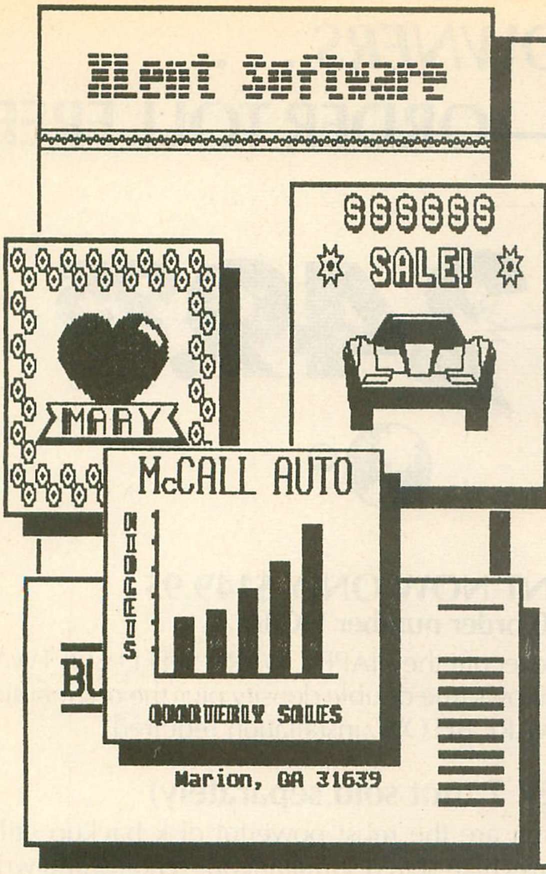
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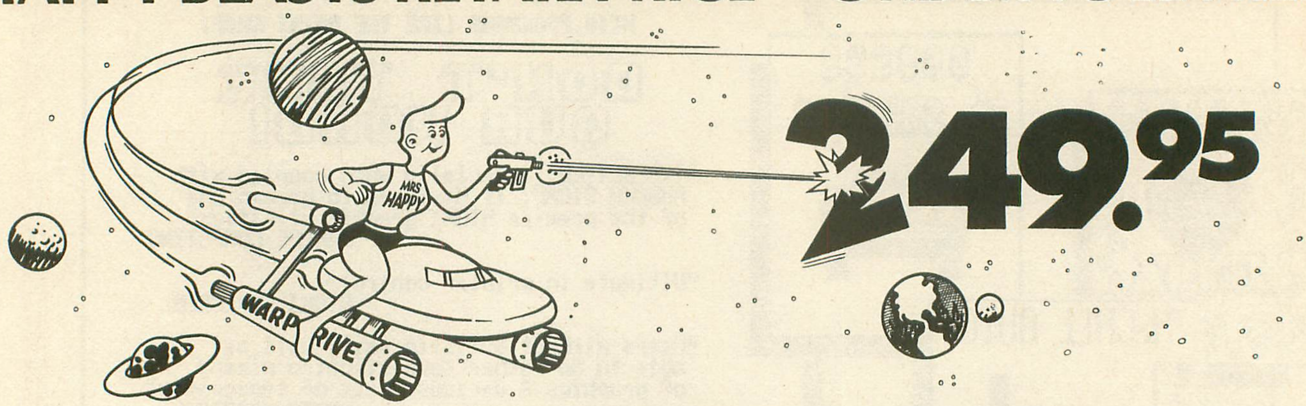
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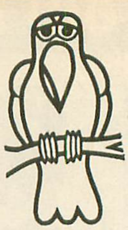
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1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
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With **Racing Destruction Set**, two players can compete against each other on auto race tracks and in racing cars of their own design. The game comes with nine types of vehicles and an array of famous race tracks already built in. This "construction set" entertainment software features true split screen scrolling.

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(quiz/study game)
Ezuse Software
2850 Enea Way
Antioch, CA 94509
(415) 754-6026
$11.50, 48K disk

Quizmaster software assists those who wish to construct quiz games or study aids that are both entertaining and practical. Pokey Piano Player routines on the entry screen and colorful graphics throughout enliven the program, which can be geared to any age, skill level, or special interest. Once data is entered, questions are asked in random order. Possible applications range from trivia games to preparation for a real estate exam. Complete instructions are included with the set.

TOP-DOS 1.5+, JxL RAMBOARDS

(memory upgrades)
ECLIPSE Software
1058 Marigold Court
Sunnyvale, CA 94086
(408) 246-8325

TOP-DOS 1.5+ ($39.95) is the newest version of the popular TOP-DOS disk operating software. It is designed to handle all Atari 8-bit computers, even those with large memory RAMboards. Improvements include BASIC enable/disable for XEs, DOS 2.5 file access, better warp speed and group autorun control. To go with it are three new AXLON-style ramboards in 256K ($149), 512K ($199) and 1 megabyte ($349).

PROTEUS

(printer buffer)
Computer Friends
6415 S.W. Canyon Court, Suite 10
Portland, OR 97221
(503) 297-2321
$199, 64K
$299, 256K

The **Proteus** parallel two-port buffer features "flexible capacity buffering," which means that at any time, each output port is allocated maximum available memory. Both buffers and a data switch controlled manually or with software are economically contained in a single box. In a typical application, both printers connected to a microcomputer via **Proteus** can be printing at the same time, immediately freeing the computer's memory.

800XL COMPUTERFACTS MANUAL

(reference book)
Howard W. Sams & Co.
4300 W. 62 Street
Indianapolis, IN 46268
(800) 428-SAMS
$19.95

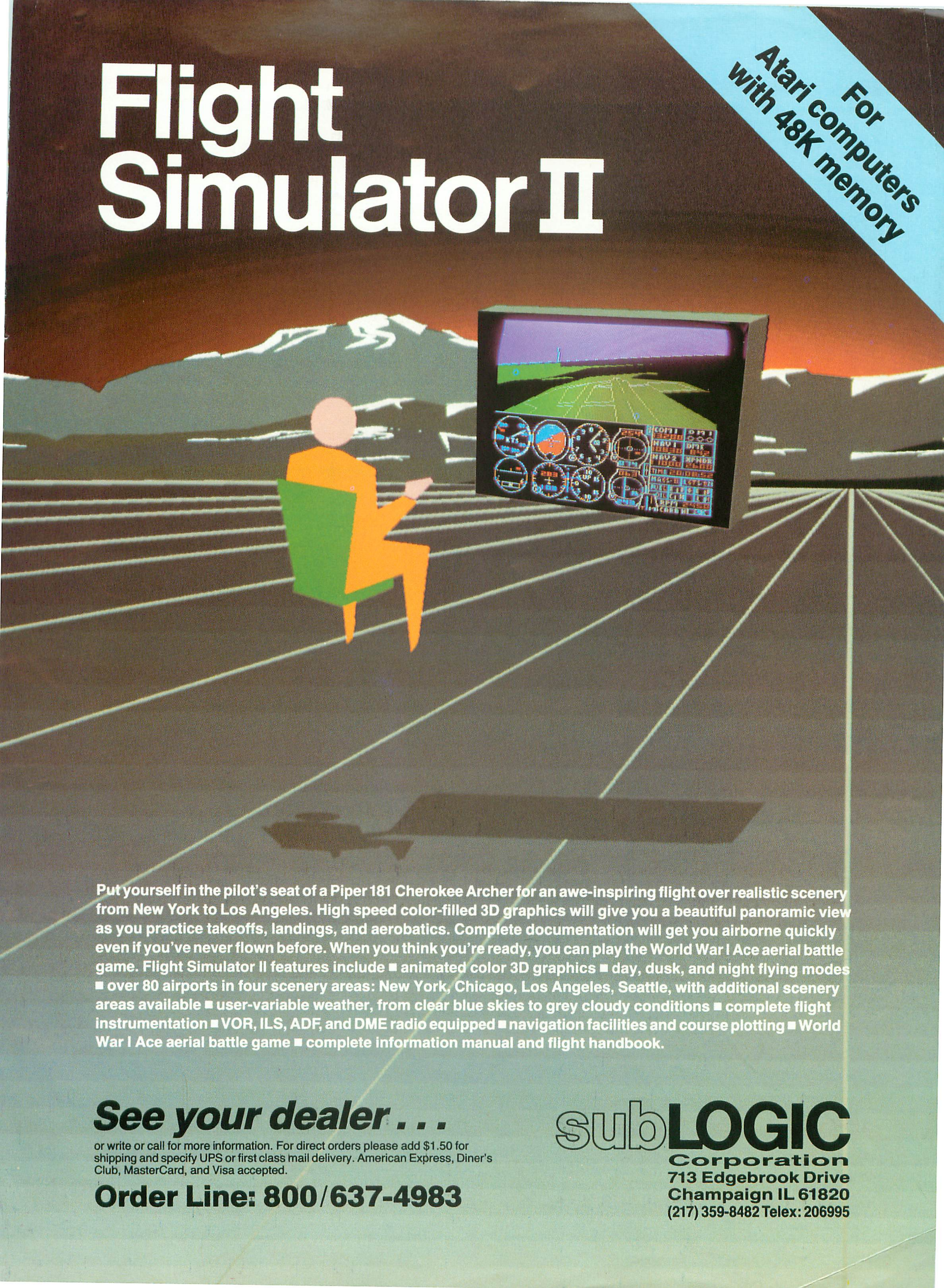
Joining the Sams service manuals for the Atari 400 and 800 computers is a new **800XL Computerfacts Manual**. Upcoming manuals are to cover the 130XE and the 520ST. The collection provides tips on troubleshooting, replacement part lists, and semiconductor cross-references. Computerfacts manuals contain standard-notation schematics created by a CAD system and reproductions of actual waveform photos taken from test equipment.

FOOBLITZKY!

(game)
Infocom, Inc.
125 Cambridge Park Drive
Cambridge, MA 02140
(617) 492-6000
$39.95, 48K disk

It's dog-eat-dog in this multi-player game of deduction, strategy and chance, in which you are an "unbearably cool canine" roaming the city of Fooblitzky. At the start of this animated romp, you and the other players secretly select one item from the stores of Fooblitzky. Moving on sidewalk squares at the roll of electronic dice, you spend your allowance of "foobles" as you try to deduce and acquire the four secretly-chosen items. **Fooblitzky** offers one to two hours play, requiring creative strategy and ruthless determination to outsmart your fellow players.

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